

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Weekly Newspaper Second-class postage paid at Boston, Mass., and additional mailing offices ©1978 by CW Communications/Inc.

37

September 11, 1978

\$1.00 a copy; \$25/year

Spin Resolution A Slap at Carter

By E. Drake Lundell Jr.
 CW Staff

TORREMOLINOS, Spain — Delegates from 75 nations unanimously adopted a resolution here last week aimed at criticizing the Carter Administration's recent decision not to allow Univac to sell a computer to the Soviet press agency Tass.

The U.S. delegation did not object, explaining later that the wording of the resolution was so general that its target was not clearly spelled out.

However, some observers believed the U.S. may not have wanted to get into a debate of the Tass sale on the next to last day of the Intergovernmental Conference on Strategies and Policies for Informatics (Spin) here.

The resolution, sponsored by Bulgaria, called on international United Nations agencies to "make every effort to

(Continued on Page 4)

Spin Nations Hammer Out Details of New World Order

By E. Drake Lundell Jr.
 CW Staff

TORREMOLINOS, Spain — The rough structural outlines for a "new world information order" were hammered out here last week under the hot Spanish sun by the 75 nations attending the Intergovernmental Conference on Strategies and Policies for Informatics (Spin).

The keys to the proposed new order will be more self-reliance and regional cooperation on the part of the developing nations and a united front vis-a-vis multinational corporations in general and IBM in particular.

But whether policy developed in sometimes angry debate will ever be implemented is in some doubt. The two sponsors of Spin — The United Nations Educational, Scientific and

Cultural Organization (Unesco) and the Intergovernmental Bureau for Informatics (IBI) — are fighting over which should have the responsibility for implementation.

The recommendations and resolutions adopted here have several major elements — standardization of software and hardware, more control over transnational corporations in the computer and telecommunications fields and further regional cooperation, among them.

One recommendation — proposed by Nigeria — noted that computers have often "been acquired to a certain extent by developing countries . . . without sufficiently trained manpower in their acquisition and use, leading to dissatisfaction" within those countries.

This lack of manpower has caused the developing nations to receive unfavorable lease and rental rates and led to underutilization and "wastage of developing nations' scarce resources."

Because of this, the meeting recommended that private companies marketing in developing countries establish training facilities and provide teachers for them in the developing nations.

Furthermore, the recommendation called on the appropriate international bodies to provide "international standard documents" for contracting for computer equipment and to develop a code of marketing conduct for the firms doing business in the developing

(Continued on Page 4)

Tells FCC to Hold Hearing Court Rescinds SBS Go-Ahead

By Edith Holmes
 CW Washington Bureau

WASHINGTON, D.C. — Satellite Business Systems' (SBS) authorization to go ahead with its plan to provide domestic satellite communications services has been tossed back into the lap of the agency that granted it.

The U.S. Court of Appeals for the District of Columbia, maintaining that the Federal Communications Commission (FCC) needs to give greater attention to antitrust questions, effectively repealed SBS' license.

SBS is a joint venture consisting of IBM, Communications Satellite Corp. (Comsat) and Aetna Casualty & Surety Co. The court determined that the FCC should have held a hearing on the anticompetitive effects this partnership might have on the communications industry.

The panel of three judges went on to state that the commission should reject

SBS' application for a domestic satellite carrier license unless it finds "no other alternative to approval would adequately serve the public interest."

The FCC handed SBS its license without a hearing in January 1977 on the grounds that the integrated digital and voice communications venture was not anticompetitive. Even if the partnership were anticompetitive, approval of the license would be in the

public interest because SBS would provide excellent service and could compete with AT&T, the FCC said.

The Justice Department, Western Union Telegraph Co., American Satellite Corp. and Fairchild Industries, Inc. objected to the FCC's reasoning and took the matter to court in several suits that were eventually consolidated.

In its 49-page opinion, the appeals

(Continued on Page 8)

Itel Unveils 138, 148 Compatibles

SAN FRANCISCO — Itel Corp. has added a family of IBM plug-compatible mainframes in two models: the Advanced System/3 Model 3 (AS/3-3) and the Model 4 (AS/3-4) to compete with the IBM 370/138 and 148, respectively.

Both models will be manufactured by

National Semiconductor Corp. and are slated for delivery starting in the fourth quarter of 1978, Itel said.

The AS/3-3 is said to be "1.4 to 1.8 times more powerful" than the 370/138 and the AS/3-4 is described as matching or exceeding the 148's benchmarks.

The AS/3-3 draws 43% less power than the 138 — 8 kVA as compared with 13.9 kVA — and the AS/3-4 draws 57% less power than the 148 — 8.2 kVA as opposed to 19 kVA, Itel added.

In addition, the AS/3 main memory, which is composed of 16K chips, is said to employ 60% fewer components than its IBM counterparts.

Finally, the Model 3 reportedly needs 40% less floor space than the 138, while the Model 4 needs 60% less space than the 148, Itel said.

Software Compatibility

"Like all members of the Advanced System family, the AS/3 is functionally compatible with IBM software," Itel Data Products Group president John Clark noted.

No software enhancement announcements accompanied the unveilings, and an Itel source indicated that the

systems are supported by the current Advanced System software products.

The Model 3 with 1M byte of main memory costs \$490,000 and the Model 4 with 1M byte costs \$600,000.

Additional memory costs \$110,000 per 1M byte. An optional 180 char./sec printer is available for \$15,000.

Action Resumes In U.S. vs. IBM As Users Testify

By Catherine Arnst
 CW Staff

NEW YORK — The U.S. vs. IBM antitrust trial returns to court this week after a six-week summer hiatus to continue the testimony of IBM's customer witnesses.

The firm is, in a sense, presenting these users as character witnesses in its defense.

IBM had originally scheduled 70 user witnesses, but in a stipulation initiated by the government's trial staff, the list was cut to 12 names on the grounds that the testimony of any more than 12

(Continued on Page 6)

Carter's Revamp Team Sees 'Confusion, Drift' in DP

By Edith Holmes
 CW Washington Bureau

WASHINGTON, D.C. — "Unless something is done soon to significantly improve the way information technology is being used in the federal government, the general well-being of the United States will be seriously jeopardized," the President's reorganization project on data processing concluded in what it hopes will be the final draft of its summary report.

Obtained here last week, the report consolidates the work of 10 teams and several months of effort on the part of 55 private- and public-sector professionals.

Despite their diversity of backgrounds, these individuals agreed that information technology has become "an absolutely necessary instrument for conducting the affairs of the nation," yet it is characterized by "managerial confusion and drift."

Underlying the report's nine recommendations to President Carter is the realization that the prudent application of information technology to the delivery of government services must be the primary responsibility of the agency or program management.

Accordingly, the overall philosophy advocated by the summary report de-

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Computerworld can be purchased on 35 mm microform through University Microfilm Int., Periodical Entry Dept., 300 Zeeb Rd., Ann Arbor, Mich. 48106. Phone: (313) 761-4700. *Computerworld* is indexed: write to Circulation Dept. for subscription information.

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Tip From Job Agency Nets Grimm

By Tim Scannell
CW Staff

FORT WORTH, Texas — Acting on a tip from a local DP-oriented employment agency, Federal Bureau of Investigation agents, have arrested a computer programmer accused of bilking

Belmont, Calif., and surrounding communities out of nearly \$250,000 in public agency funds.

Richard Grimm was taken into custody after he sought employment through an agency serving the Fort Worth area, according to a spokesman

for the firm, which chose to remain unidentified. While screening the programmer for possible DP positions, agency officials noticed an article in a recent issue of *Computerworld*, that described Grimm's alleged activities in Belmont [CW, Aug. 28].

The employment agency immediately alerted the FBI's regional office and Grimm was arrested as a federal fugitive in violation of the bureau's Unlawful Flight Provision. The FBI refused to divulge details of Grimm's apprehension because of the laws protecting an individual's right to privacy.

Law enforcement officials have been seeking Grimm since his abrupt disappearance from Belmont last March. Grimm had been contracted to program Belmont's newly acquired mini-computer system, purchased from Digital Equipment Corp. through a nationwide leasing company.

However, it was later discovered not only that Grimm failed to program the PDP-11/34 system, but that he had also allegedly forged \$89,000 in checks and vanished with more than \$150,000 in public funds.

Trailer Crash Kills Driver, Destroys DEC Shipments

By Don Leavitt
CW Staff

FARMINGTON, Conn. — An unexplained truck accident here two weeks ago left the young driver dead, the truck and its load of computer systems wrecked and the installations in Ohio that had been awaiting the shipments waiting even longer.

The semitrailer truck was headed west on "double-barreled" Interstate Route 84 on Sunday, Aug. 27, when it went into the wide grassy median strip, crashed through a guard rail, rolled down an embankment and flipped over, according to a Connecticut State Police dispatcher in Hartford, 10 miles away.

The road was dry and there were no skid marks when police reached the scene. The cause of the accident is still unknown and under investigation, the police officer added last Wednesday.

The truck was owned by Almac Moving & Storage, Inc., an agent for North American Van Lines, based in Southboro, Mass., and at least the majority of the systems aboard were from Digital Equipment Corp., probably from its Marlboro, Mass., facilities. Spokesmen for each of the firms were very guarded, however, in comment-

ing on the accident or the cargo, citing insurance claims and client/customer responsibility.

Neither firm would identify the companies to which the equipment was headed although they acknowledged they were all in "the Ohio area."

In addition to refusing to name the destinations of the now-wrecked equipment, DEC also declined to explain, even in general terms, what it has done or is doing to get replacement gear, or time on other users' gear, for the DP centers that were scheduled to get deliveries from the Almac truck.

Univac Cancels Accuscan

BLUE BELL, Pa. — "Consumer opposition" to the Universal Product Code (UPC) marking of retail merchandise has prompted Univac to "cease marketing" its Accuscan supermarket key entry and scanning system, the company has announced.

But supermarkets have grown reluctant to purchase such systems because they feel compelled by consumer pressure to continue marking prices on their merchandise, a Univac spokesman explained. Some states now re-

quire price marking by law, and consumer activists are pushing for similar legislation in other states.

Univac has advised Accuscan users of its decision, the spokesman said, noting that 100 Accuscans are presently installed or on order.

The vendor will continue to honor all contractual commitments related to Accuscan and will support and provide maintenance for the systems until 1985, after which maintenance will be on a time and materials basis.

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As part of our new series of non-commercial, public-service messages, we bring you the following:

TRAVELERS' ADVISORY

DOS/VS users planning extended journeys through uncharted sorting territories are advised to exercise *extreme caution*. Vampire sort programs have been reported preying on unsuspecting programmers and managers.

While these Vampires may at first appear hospitable, once the main gate has clanged shut behind the hapless traveler, a transformation soon takes place in the host.

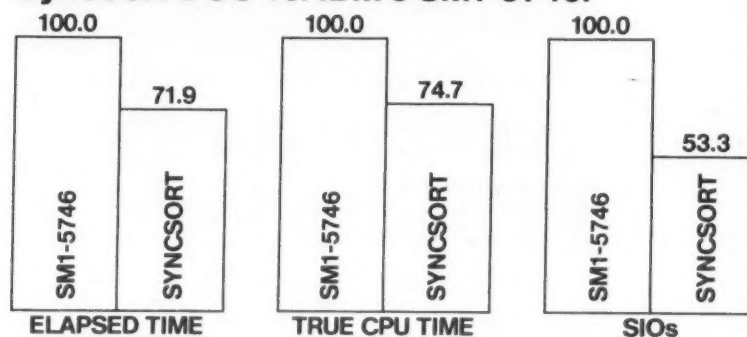
Victims report that they have been attacked, almost immediately, in their computer resources. A sharp stinging sensation in the neck is followed by weakness... loss of desire... and, ultimately, by an inability to perform even the simplest data-processing function.

Only one effective safeguard exists. Sorters are urged to carry a copy of SyncSort DOS with them at all times. If attacked, thrust SyncSort as close to the Vampire's face as possible and repeat loudly: "I challenge you to a benchmark!"

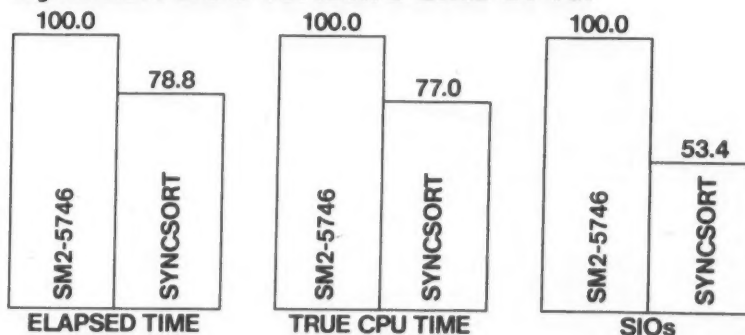
At this the Vampire can be expected to fall back in consternation, shielding his eyes from the light. Moments later he will flee screaming into the night.

The reason for this bizarre behavior, Vampirologists explain, is that no Vampire sort program can endure the thought of being in the same castle with benchmark results that look like this:

SyncSort DOS vs. IBM's SM1-5746.



SyncSort DOS vs. IBM's SM2-5746.



Chinese Planning More Active World DP Role

By E. Drake Lundell Jr.
CW Staff

TORREMOLINOS, Spain — The mainland Chinese are going to become more active in the world computing scene, their delegates indicated at the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) here last week.

The move is part of the Major Chinese effort to establish ties with the rest of the world and with the Western technological establishment in particular, according to the delegates here.

The Chinese have targeted computer science as one of the eight major fields for development within the country, according to Pei Lin Yen, chief of the

People's Republic of China delegation. Yen, who heads the Bureau of Basic Sciences in the National Commission of Science and Technology, said information science is regarded as an important part of the present 12-year

CW At Spin

modernization effort within China because computing can play an important role in what is called the "Four Modernizations Program" — that is, the effort to upgrade the Chinese na-

tion in the areas of agriculture, industry, education and science."

'Urgent Measures'

Because computing is important in all these areas, Yen said, the nation is taking "urgent measures" to develop the computer industry.

At present, the Chinese are producing a machine capable of one million instructions per second (Mips). Efforts are under way to improve the integrated circuits industry and the peripheral equipment industry in the country.

Applications of computer systems in the past have been concentrated in the area of mathematics and science, Yen said, but he added that the country is now developing programs for the management and public administration area.

The Chinese now have a "score" of training programs, both on the academic and on the more practical level, he said. Yen expects the level of infor-

matics training to move faster in the near future.

As part of this effort, Yen announced that China will send students to study in the future at Western universities and technical institutes, a practice that has not been undertaken in the past. The Chinese are doing this, he said, because while they feel that "independence and self-reliance" are the key to a national computer industry, this does not mean they need to be isolated from worldwide developments.

In order to reduce this isolation, China will participate more and more in international exchanges of information in the computing field.

In a related development, Hsin-Hua, the official Chinese news agency, announced last week that foreign technical experts will be invited to teach and lecture in China in the future. It was not known, however, whether any of these would initially be in the computer field.

Resolution Slaps at U.S.

(Continued from Page 1)

promote the abolition of discriminatory restrictions, for political or other motives, in the exchange of scientific and technical documentation and the sale of computer hardware and software."

And while the resolution doesn't mention the U.S. by name, the intense parliamentary maneuvering over the resolution throughout the conference was evidence that the delegates understood its purpose.

The resolution was originally scheduled to be debated during the first of the sessions of the two working groups considering draft resolutions here. At the last minute, however, the conference decided not to debate it until the final plenary session, slated to adopt the conference's recommendations.

At that session, the resolution was put last on the list of measures to be acted upon so it would be considered when the delegates were tired and had their fill of debate. The resolution was taken up by the group at about 6 p.m. on the busiest day of the conference.

And even then the presiding officer pushed it through quickly, stating that

the resolution was adopted before anyone could object to it or support it.

So after a week of intense consultation among the various groups here on how to handle the situation, the actual adoption of the resolution was anticlimactic — no debate, no fuss.

U.S. delegates later said the resolution could be read as criticizing all discriminatory restrictions such as tariff barriers and "buy national" policies, which U.S. companies have criticized for years. In fact, many of the Third World countries supporting the resolution have some of the most discriminatory practices, delegation sources said, so the resolution also applied to them.

Furthermore, the U.S. delegation said that the resolution was aimed at only politically motivated discriminatory practices and insisted that the cancellation of the Tass sale was a "national security" matter and therefore would not come under the terms of the resolution.

But while the U.S. was clearly putting the best possible light on the resolution, Third World nations said they meant its adoption to be a slap at the Tass cancellation, no more and no less.

New World Order Outlined

(Continued from Page 1)

world.

The recommendation also called on the firms to make "regularly available" information on progress in the field "including changing prices and policies."

Another major group of recommendations came from Algeria, Iraq, Iran, Jordan and Syria and exhorted the international organizations to "make efforts to establish international standards in software so it may be of a general nature and independent of any specific manufacturer and/or equipment."

Furthermore, the recommendation called upon those responsible for informatics "to see to it that the suppliers of hardware and software take full account of the prevailing conditions in the importing countries and undertake their adaptation and conditioning to suit the cultural, social, economic and environmental conditions of those countries."

Another provision of this recommendation called on the international organizations to speed their work in drafting a code of conduct for technology transfer.

A final recommendation called on international organizations to engage in policies "designed to promote beneficial competition among the limited number of suppliers and to require regularly updated price lists."

World Software Bank

The major USSR initiative adopted by the conference called on Unesco and IBI to begin working on "the future establishment of a world software bank" which could provide standard software to different nations.

The African Group — made up of 16 black African nations — called on Unesco to work with the UN Center on Transnational Corporations to "introduce a program to strengthen the negotiating position of all countries, and particularly the developing countries, with regard to transnational corporations."

Such a program is needed, the proposal said, because of "restrictive and discriminatory commercial practices of transnational corporations which op-

erate to the disadvantage of developing countries."

In another recommendation aimed at making countries less dependent on the computer manufacturers, France recommended and the conference adopted a resolution calling on Unesco and IBI to "take all necessary steps to further the establishment of national or regional centers enabling countries to undertake, in whole or in part, their own hardware and software maintenance."

Data Base Resolutions

Noting that 10% of the world's population has 95% of the world's information at its disposal in computerized data banks, a recommendation by Benin and Tunisia called for aid in assisting developing countries to "obtain access to information located in national and international data banks in the more advanced countries."

Another data base resolution — this sponsored by Bolivia, Morocco and Tunisia — recommended that "countries which have developed substantial data base capabilities should provide in their programs for the use of scientific and technological information resources by all interested countries."

Another adopted resolution sponsored by the Soviet Union noted that standardization is "in the interests of peace and mutual understanding between peoples" and called on Unesco to convene a meeting in cooperation with the International Standards Organization to discuss further international standards in the field.

Regional Training

Most of the other recommendations adopted here concerned specific issues of regional and international cooperation, calling primarily for the establishment of regional centers for training in informatics.

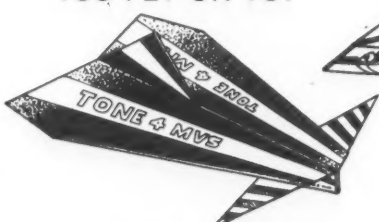
It appears now that these centers — if the finances can be found for them — would follow language lines: one for the Arabs, one for French-speaking countries, one for English-speaking countries and so forth. However, while such centers were recommended for study, no specific proposals were announced.

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Informatics Funds at Issue

Infighting Between Sponsors Mars Conference

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — An interesting but somewhat vicious battle sprang up here between the two organizations that sponsored the International Conference on Strategies and Policies for Informatics (Spin).

The battle between the United Nations Educational, Scientific and Cultural Organization (Unesco) and the Intergovernmental Bureau for Informatics (IBI) often hampered the work of the 10-day conference which ended last week and in some ways spoiled the chances for a meaningful result.

While many in the U.S. may not be accustomed to the infighting that occurs between UN agencies, the basic roots of this battle — as with most others — was money, with both Unesco and IBI fighting for larger slices of the pie.

The IBI is a creature of Unesco, established several years ago to handle the issue of "informatics," or national computing and telecommunications. It was funded by Unesco and still receives support from that organization.

Unesco, with almost 100 members, is large and known around the world, while the IBI is small, with just 27 nations on its membership roster.

Over the past few years, more and more of the developing countries have asked for funding for informatics projects. Most of these requests are made to the UN Development Projects Office, which gives UN member countries millions of dollars each year for projects those member countries wish to undertake.

While the Development Projects Office gives the money — which is usually matched by the country or region seeking the grant — the funds are administered by the appropriate UN body, if there is one.

The office has given close to \$30 million for informatics projects in the past several years. It is conservatively estimated that member countries will seek almost \$100 million for such projects in the next few years.

The 14% Plum

Obviously the organization responsible for administering such a large fund will become very powerful. However, there is another aspect to this situation — the organization which administers the fund can keep 14% of the amount for "administrative" purposes.

In other words, the body which administers informatics programs in different nations will be able to give away \$86 million and keep \$14 million for administration over the next few years, if the estimates of informatics spending are correct.

This would be quite a plum for either IBI or Unesco. The IBI budget runs about \$2 million every two years and Unesco's budget runs at about \$140 million yearly.

The situation seemed to come to a head at Spin, even though many wondered why Unesco — with the active support of the U.S., which seems to want to destroy the French — and Third World-dominated IBI — apparently wants to put the IBI out of business.

The antagonism expressed at Spin, however, was clouded behind a smoke-

screen of protocol. Delegates were startled the first day to see the representatives of both Unesco and IBI fighting over the seating arrangement at the head table.

The fight went even farther — Unesco representatives sneaked into the conference hall at lunch time and rearranged the placards for the different organizations — downgrading IBI — while others were eating. This led to a donnybrook over the placards, with IBI finally upgraded, when the heads of delegations returned.

In another display of childishness by supposedly mature organizations, the Unesco-run pressroom held a news conference on the second day of the

conference; after initially inviting an IBI representative, IBI was suddenly not allowed to come to speak.

The U.S., which kept an extremely

considered setting up common purchasing arrangements to give those countries more leverage with such U.S. multinationals as IBM.

However, with the larger membership of Unesco — and with greater American control in that organization — such issues are usually either bypassed or voted down.

Strangely, however, the U.S. maneuver may have been self-defeating. As one IBI consultant said, "U.S. opposition has given us a boost in the Third World. If [the Americans] had wanted to kill us, they should have embraced us with open arms, and then all the Third World countries would have bailed out."

Analysis

low profile at the meeting, was most active in the effort to downgrade IBI, with the head of the American delegation, John Fobes, going as far as to say the U.S. couldn't support resolutions which called on the IBI for action.

With African, Asian, Arabic and Latin American organizations dominating IBI, the organization has seriously

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Criticism of IBM Muted But Evident at Meeting

By E. Drake Lundell Jr.
CW Staff

TORREMOLINOS, Spain — Two of the most interested observers at the 10-day Intergovernmental Conference on Strategies and Policies for Informatics (Spin) that ended here last week represented no country and never made a formal speech.

But the distinguished-looking, silver-haired gentlemen listened carefully and attentively as their organization was criticized by Third World country after Third World country and as the conference adopted resolution after resolution that could seriously affect its future if ever implemented.

They were John Manning and Carl Dorn of IBM, which has greater annual revenues than more than half of the countries that criticized — politely — their organization.

The low-key nature of the criticism may have been a pleasant surprise to Manning and Dorn. The delegations at Spin were much less political than those at many of the meetings of United Nations bodies since most delegations sent technocrats — who understand the technology of computing and information interchange — rather than long-winded politicians.

In addition, the meeting was the first of its kind — the first time the technical, social, cultural and political issues raised by computing have formally been discussed on a worldwide scale. Many of the delegates were therefore unknown to each other and spent a great deal of time just getting acquainted.

That is also why most of the real action and interchange during the 10 days the delegates met here took place outside the formal presentations in the magnificent Palacio des Congressos. Delegates buttonholed each other around the swimming pools at the luxurious resort hotels and on the shore of the Mediterranean.

In one such interchange, IBM's Dorn was seen telling the Chinese delegation about the various ways IBM has for

financing computer systems and outlining the various reasons for making the purchase vs. lease decision. The unofficial meeting was held in a corner of the lounge in the Aloha Puerto Hotel, which served as the meeting place

CW At Spin

for several such discussions.

The weather also helped the mood. The Costa del Sol was washed in sun for the entire duration of the conference, with cooling breezes in the afternoon, as the delegations from 75 countries tried to come to grips with a consensus view of where worldwide information interchange should head in the

next few years.

Delegates from such nations as Lebanon and Mexico found they had common technical problems they could discuss; the nine-country Arab bloc met regularly to discuss technical issues as well as the political background; and the group of 16 black African countries spent an entire week-end in information interchange while some other delegates toured the Alhambra.

But while the criticism of transnationals such as IBM was muted, it was clearly one of the themes of the conference and a great deal of bitterness was evident under the surface, particularly in countries where the governments and IBM have been in conflict, such as Nigeria and Indonesia.

IBM was never mentioned in a critical way. It was always "some" or "a

transnational" or "multinational" corporation.

Even the Arab-Israeli conflict was quiet, with only Syria making reference to it. Both the Arab and Israeli delegations went about their business.

In fact, the only major jarring note in the whole meeting was the conflict between the United Nations Educational, Scientific and Cultural Organization (Unesco) and the Intergovernmental Bureau for Informatics (IBI), the joint sponsors of the meeting, which are squabbling over which agency should be in charge of informatics programs (see story on Page 5).

But while the meeting may have been low-key, the mere facts that it was held at all and that 75 nations could agree on a common action program were major accomplishments in themselves.

IBM Users Testify as U.S. Case Resumes

(Continued from Page 1)

would be "cumulative."

Before the summer recess, IBM managed to place three of those 12 on the stand. Each testified for approximately 10 days, in spite of an earlier claim by IBM attorneys that the user witnesses would take only a couple of days each.

Then last month, seven of the remaining nine user witnesses were dropped, again at the suggestion of the Department of Justice and again on the grounds that their testimony would be cumulative.

The testimony of the first three users did bear striking similarities. All were from major corporations with large centralized DP operations: James Welch, senior vice-president of the Information Services Group of Chemical Bank in New York; James O'Neill, vice-president of DP and communications services at American Airlines; and John McGrew, director of operations, computing and telecommunications services for Union Carbide Corp.

In their questions to these witnesses, attorneys for IBM concentrated on the various alternatives to IBM equipment available to them, the superiority of IBM equipment and services when compared with those alternatives and the users' perceptions of the parameters and competitive nature of the computer industry.

The government has charged IBM with monopolizing the general-purpose computer systems market as opposed to the large-scale scientific system or small business system and minicomputer sectors. Also included in the general-purpose market, according to the government, are plug-compatible disk drives, tape drives, add-on memory and systems software, but not terminals.

Users' Definitions

However, the users presented a broader definition of a general-purpose computer system and a more flexible version of the interchangeability between large-, medium- and small

scale CPUs. All included terminals as part of a computer system.

Welch, during his direct testimony, testified that an application designed for a large IBM 370/168 could be run on a minicomputer such as the IBM System/7, although it would not perform as well. "I cannot recall a single device which I am familiar with that has a CPU that doesn't act in some form as ... a general-purpose computer system," he said.

Later in his testimony, Welch said he didn't consider Digital Equipment Corp.'s PDP-11/50 processors as minicomputers, but rather as small general-purpose computer systems because they are capable of performing large amounts of DP. Chemical Bank is currently moving some of its applications, such as funds transfer, from its IBM 370/168 to a Collins C-900, which is made up of DEC minicomputers.

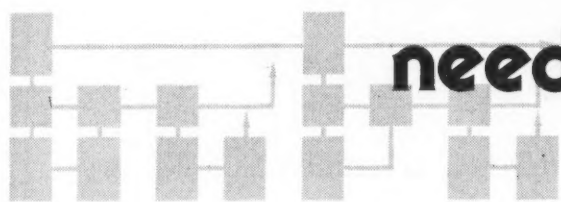
O'Neill also labeled practically every CPU about which he was questioned a general-purpose computer system and made no distinction between those and what the government describes as scientific systems. O'Neill also went so far as to group such units as the IBM 3705 communications control unit with a large 370/168 CPU under the label "processor."

However, on cross-examination, he elaborated on his generalization by testifying that he was instructed by IBM counsel to use only one term in explaining the functions of the various pieces of equipment at American Airlines, and the term he chose was "processor."

All the witnesses testified that they evaluated all viable alternatives to IBM equipment when making new acquisitions.

During cross-examination, the government attempted to emphasize that it would be difficult for any of the users IBM placed on the stand to choose a major piece of equipment such as a CPU from a manufacturer other than IBM without making substantial changes in its software and interfaces.

This type of balancing act by the parties will probably continue with the final two user witnesses: James Jones, vice-president of management information services for Southern Railway Co., who takes the stand today; and Donald Hart, head of computer sciences for General Motors Co.



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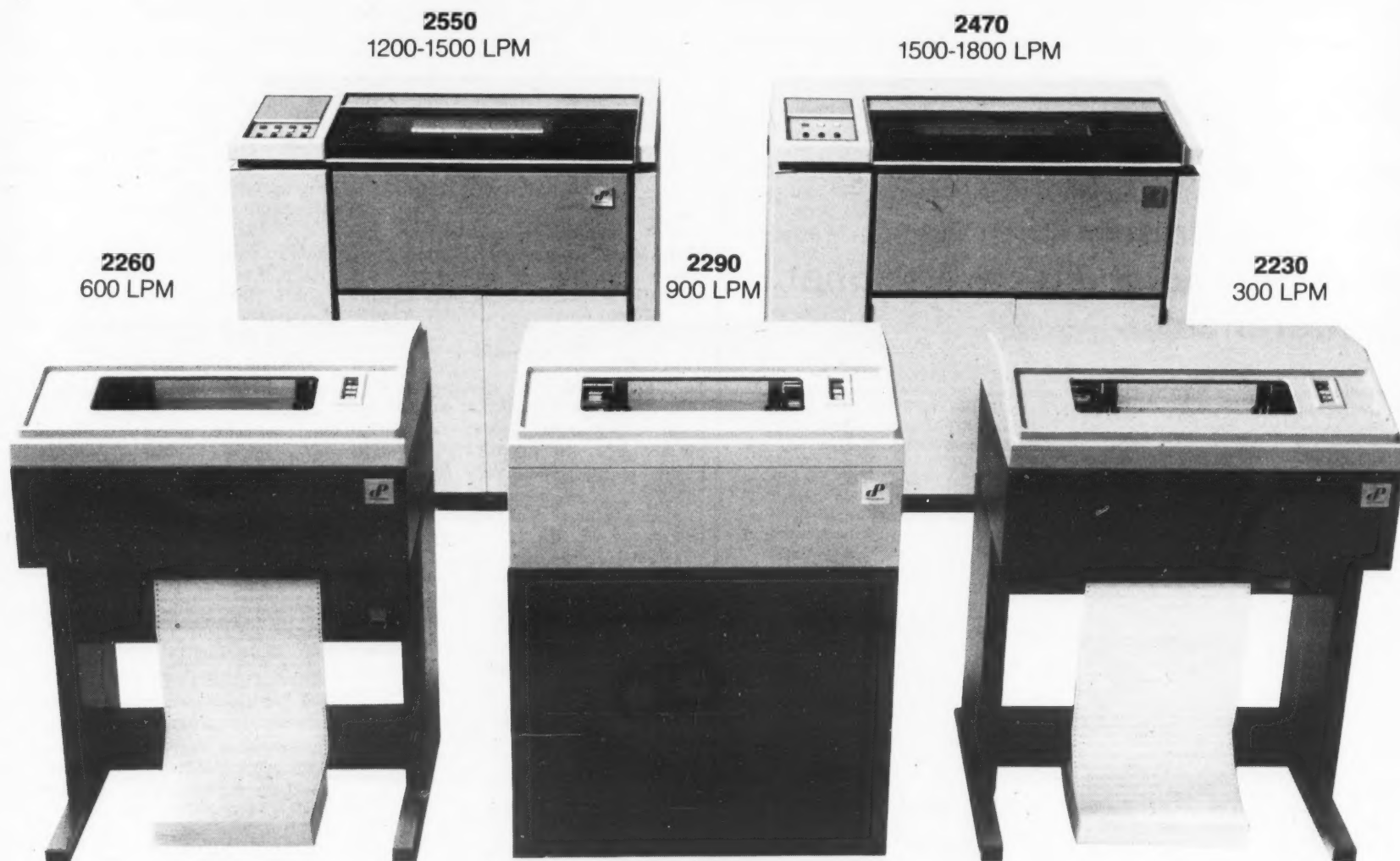
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Court Repeals FCC Grant of SBS Go-Ahead

(Continued from Page 1)

court reviewing these challenges to the FCC's action stated the Commission was required by law to hold a hearing before it could make a judgment on SBS' anticompetitive impact on the industry. Under Section 2 of the Clayton Antitrust Act, the FCC is charged with antitrust enforcement for communications.

SBS Still Proceeding

While Comsat and Aetna had no comment to make here last week, an IBM spokesman simply said, "We're surprised at the court's opinion and we're confident the FCC's decision ultimately will prevail."

The SBS spokesman indicated the firm does not believe the court's decision will delay construction of the system or the start of commercial operations, currently scheduled for early 1981.

Contracts have not been halted as a result of the judicial decision. The partners have already spent more than \$86.2 million on the satellite project; its total cost by 1986 is estimated to be about \$406.9 million.

The FCC last week continued to have no reaction to the appeals court's Aug. 29 decision. Chairman Charles D. Ferris and other top FCC officials were on vacation when the ruling was made and hadn't been back long enough to comment.

The FCC's General Counsels' Office suggested the commission will first have to decide whether to appeal the

court's decision.

The court's mandate to the FCC goes into effect Sept. 19. SBS' construction permits technically will be cancelled as of that date. SBS may apply to the FCC for permission to continue construction of ground facilities at its own risk in the absence of permits, however, attorneys in the communications field said here.

Having won its point concerning the holding of a hearing by the FCC, potential SBS competitor AT&T stated, "we welcome the opportunity to take part in the hearings so the issues involved may be resolved."

"Western Union is pleased that the court recognized the merit of the issues we raised in this case," a spokesman for that company said.

Specialized carriers MCI Telecommunications Corp. and Southern Pacific Communications, Co., however, expressed fears that the court action would delay SBS plans. Both firms believe SBS could be a major contributor to business users and to the entire communications industry.

MCI and Southern Pacific contended SBS will help rather than hurt competition. The firms anticipate the appeals court decision could cost the satellite venture one or two additional years.

SBS has awarded Hughes Aircraft Corp. a \$63 million contract to build three communications satellites.

In its decision, the appeals court rejected FCC reasoning that the domestic satellite industry is too new and exper-

imental for a hearing that could produce any useful evidence about domestic satellite operation and economics.

Equally illogical, the court maintained, was the FCC's argument that domestic satellite communications is not a separate submarket of the communications industry because it is in-

terchangeable, to some degree, with terrestrial communications.

The court could not rule that SBS' benefits are undisputed. Nor could it find any basis for the FCC's assumption that if IBM entered the domestic satellite business alone, it would not be as technically qualified as it would in a partnership with Comsat.

Revamp Team Sees Drift, Confusion in Federal DP

(Continued from Page 1)

depends on "earned autonomy" — a management strategy that seeks to balance control from the top of organizations with decentralized management.

"The key to this concept, under this or any other name, is that the amount of central agency review and oversight is in direct proportion to an agency's demonstrated competence in the utilization of information technology," the report explained. "The federal government must reward competence and, by rewarding it, build it and strengthen it."

The current mismanagement of information technology resources manifests itself in equipment obsolescence, in the undercapitalized support of white collar workers and in public complaints about delays and inaccuracies at many service delivery points, the reorganization report said.

Similarly, further evidence of the failure to use these resources lies in the government's inability to protect the rights and privacy of individuals from intrusion of government agencies and others; in the growing economic threats which have been accelerated by the availability of technical information and products flowing freely from the U.S. into "competitor" nations; and in a military enterprise that is vulnerable and unprepared to meet even peacetime crises as a result of the obsolescence of machines and skills, the report stated.

Plea to President

The situation is so serious that only the President himself can express the degree of commitment to change that is required, the project's participants said. In this context, they recommended that:

- Executive orders establish the importance of information technology and goals for its use by creating an Office for Information Resource Management in the Office of Management and Budget (OMB); an information resource manager within each department and agency, reporting to the senior administrator; a Special Assistant to the President for Information Technology Policy, Plans and Programs; and a National Council for Information Technology Policy, Plans and Programs.

- The federal government be committed to establishing a nationwide network of human services delivery centers. A Presidential task force should develop a plan for implementing single, integrated eligibility determination systems, decentralized services delivery and guidelines for administering federal human resource programs.

- OMB design a policy requiring that

DP costs be charged back to user agencies or programs wherever possible in order to make the using organization responsible for the management of information technology resources.

- All information technology components that have outlived their cost-effective lives be removed from government service.

- The present emphasis in acquiring information technology resources be shifted from procurement activities to planning, defining and justifying the need for the use to be made of systems.

- Agencies should receive more procurement authority. The threshold requiring supervision by the General Services Administration (GSA) should be raised from systems costing \$50,000 to \$3 million. OMB should take the lead in clarifying directives sent to the agencies by itself and GSA.

- The Civil Service Commission be directed to establish a new occupational group called "information science," to cooperate with colleges and universities and to develop criteria and methods for formal certification of DP personnel. The federal government should take steps "to emphasize the importance of the people who operate the systems that manage our nation's information resource."

- Program and mission agencies be able to bolster their needs for managerial and technical expertise in information technology by going to specialized assistance centers financed through a central ADP fund.

- A research and development program in information technology be instituted to meet the needs of the non-defense sector of the government. This program should be established at an initial level of \$25 million and be increased over a period of about five years to \$100 million. The Institute for Computer Science and Technology, currently in the Commerce Department's National Bureau of Standards, should be absorbed by this R&D program, reporting directly to the department's Assistant Secretary for Science and Technology.

- Efforts to establish and maintain a standards program for information technology be revitalized to support the economic purchase of equipment and the economic and effective operation of computer resources.

Under the reorganization project's scheme, much of the burden for fulfilling these recommendations falls on OMB's shoulders.

The project's participants hope to present their draft summary report to OMB by the middle of October and to have their memo to President Carter drawn up by that time.



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Ahead of Privacy Questions Economic Issues Top Spin Delegates' Concerns

By E. Drake Lundell Jr.

CW Staff

TORREMOLINOS, Spain — The fear of losing personal privacy pales in the face of other concerns growing out of the practice of transferring computerized information across national borders. These concerns include the loss of jobs and the loss of exchange currency, delegates at the Intergovernmental Conference on Strategies and Policies in Informatics (Spin) agreed here last week.

But of all these, dependence on other countries for data processing may be the most serious concern, the delegates said in a special session called by Brazil to discuss the transborder data issue.

These other questions, the delegates suggested, may be more difficult to deal with than the protection of privacy of individual information in international information systems because they raise economic questions rather than just ones of policy.

There is a large problem of competition in the area of transborder data flows, according to Ricardo A.C. Saur, executive secretary of the Brazilian EDP Coordination Committee.

The suppliers of services from North America tend to underprice those services, he charged, essentially "dumping" computer services in other countries.

These suppliers have already paid for the development of the services they can offer overseas, he said, and therefore can make these services available at very low prices merely by keeping their computer centers open at what are off-peak times at home, he indicated.

This "dumping" amounts to unfair competition with the developing services in the countries involved, he said. Local development is discouraged because of the fear that the large North American suppliers may enter the developing countries market with under-priced services at any time they want.

Control Problem

Another problem in transborder links is control, he said. For example, he cited a proposal for conducting testing of parts at a factory via a link to a computer center in the U.S. But then, he said, the country in which the plant was located would be completely at the mercy of that link and if it were cut — either accidentally or purposefully — the plant would not be able to operate.

Because of these factors, he indicated that regulations should be established to prevent service dumping by the more developed nations, and he said that the developing nations should not rely on remote computer links for any of their production operations.

The economic impact, particularly on valuable foreign currency reserves, is another issue that needs close study, according to the French delegation, led by Jean Claude Pelissolo.

To date, practices have not taken into account the value of information flowing between countries. In most cases, the information flow seems to be from the less developed nations to the more developed, he noted, and this often leads to a state of dependence on the part of the developing nations.

This "information dependence" can lead to questions of national sover-

eignty, he said, particularly with decentralized networks.

The final problem discussed by the French was that of information "leakage," particularly from countries with strong regulations to those with less strong regulations. In such cases, the countries with strong regulations have no assurances that their information will be properly protected abroad.

Because of all these problems, he said, it would be difficult to develop one single instrument or law to cover all contingencies, and countries interested in the area should consider the issues separately when preparing regulations.

In a plug for regulation of data flows,

Kerstin Aner, heading the Swedish delegation, assured business users that regulations on data flow would not hurt business but rather have the "opposite effect."

CW At Spin

It is a little late to act, but something must be done now, she said, adding that harmonious laws around the world would make it easier for businesses because they would know what to expect wherever they operated.

The delegate from the Organization for Economic Cooperation and Development, Hans Peter Gassman, also supported the need for harmonization of laws on data flows, particularly since the world has now entered an "era of data interdependence."

The nations of the world "must maintain a data partnership," he said, and laws need therefore be consistent in different countries.

On the privacy question, Austria's Gerhard Stadler declared that "privacy is a basic constitutional right" and that informatics "needs to be controlled when it hurts the right of individual citizens."

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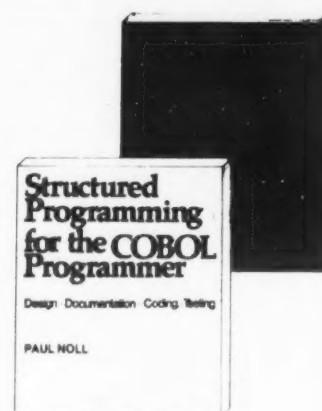
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Commerce Pushing to House DP Support Units

By Don Leavitt
CW Staff

WASHINGTON, D.C. — The Federal Computer Performance Evaluation and Simulation Center (Fedsim), the Federal Cobol Compiler Testing Service (FCCTS) and the Federal Conversion Support Center (FCSC) provide substantial ongoing technical assistance — and not just procurement support — to many government agencies.

That in a nutshell is the argument for relocating those three DP support facilities within the Department of Commerce, according to a letter written recently by Jordan J. Baruch, assistant secretary of Commerce for science and technology.

In effect, Baruch's Aug. 15 letter to Walter J. Hasse of the Office of Management and Budget (OMB) countered arguments made earlier by General Services Administration (GSA) Commissioner Frank Carr. Carr wrote to Assistant Secretary of Defense Fred P. Wacker urging that the three support groups — now managed by the Air Force or the Navy — be moved into GSA because procurement work is their primary function [CW, Aug. 28].

Although the Department of Defense is willing to shelter the groups if it has to, there is a feeling in the Pentagon that since Fedsim, FCCTS and FCSC all have missions that are governmentwide in scope and not directly related to the national defense, there should be a more appropriate home for them.

Argument by Commerce

The meetings, discussions and arguments among the agencies which might provide such a setting for the three DP support groups have been going on for some time but surfaced only this summer, apparently in the light of the reports produced by the federal DP reorganization project.

Reacting to a draft OMB issue paper dated Aug. 7, Baruch told Hasse the three facilities "properly belong" to Commerce since their activities are "related closely to DP technical advisory responsibilities assigned to Commerce" by the Brooks Bill.

Fifty-five experts of the federal DP reorganization project assembled by OMB arrived at basically the same conclusions, the letter continued. "This was apparent in the recommendations of the draft Central Agency team report and the draft consolidated project report," Baruch asserted.

Additional support was in Rep. Jack Brooks' Aug. 3 letter to Wayne Granquist, OMB's associate director for management and regulatory

policy. That letter, the Commerce spokesman continued, stated that consideration should be given to transferring the Conversion Center and Fedsim to Commerce "so that agencies need make only one stop in seeking professional DP assistance."

Transferring Fedsim to Commerce would enable that DP support group to maintain its very effective user assistance; in addition, Baruch said, such

a transfer would enable Fedsim — "which has provided excellent DP assistance to operational agencies in the past" — to retain its current identity.

Beyond that, Fedsim's direct experience in agencies' operational problems would be a "valuable resource" to Commerce's DP standards activities and a "significant" factor in improving on the recent trend to produce "high-quality, pertinent standards."

Fedsim does provide significant assistance to agencies in procurement-related problems, the Commerce spokesman said, apparently acknowledging arguments such as those of GSA's Carr that his agency is the appropriate home for all three of the DP support groups.

But, Baruch reminded Hasse, agencies "readily use Fedsim" for that kind of support "because of the strict confidence

maintained." No details of any Fedsim work are published unless and until the agency for whom Fedsim is working gives clearance for the publication.

"This would not and cannot be the case if Fedsim is transferred to a procurement agency," such as GSA, he said. "Doing so would critically hurt one of Fedsim's most useful functions."



Four Studies Agree, Disagree Survey Recap Shows Wide Variation in Salaries

By Marguerite Zientara
CW Staff

A comparison of four DP salary surveys conducted in 1978 shows there are about as many points of agreement as disagreement among them despite widely differing results.

Of the three surveys dealing with the increase in 1978 DP salaries over those of last year, two reached similar conclu-

sions. A *Computerworld* survey of 27 major U.S. firms [CW, Jan. 9] found the average rise in DP salaries to be 11.2%, with increases varying from 2% to 30%. The firms surveyed represented manufacturing, service, insurance, banking and transportation businesses.

A later survey [CW, Aug. 14] showed a slightly higher over-

all salary increase of 12.4%, with an increase in demand for DPs of 21.7% over 1977. That survey of more than 4,850 U.S. firms was conducted by National Personnel Consultants of Seattle, a network of 100 professional recruitment firms.

A third survey, however, indicated starting salaries for the industry as a whole had en-

joyed only a 6.3% hike over 1977 [CW, April 3]. Conducted by Robert Half Personnel Agencies, Inc., of New York City, the survey comprised a yearly report based on the analysis of position requests received by the agency's 55 offices in the U.S. and not on a random sampling of salaries then paid in DP installations.

In addition, the survey figures represented a national average with salaries probably 15% to 20% lower in the Midwest and 10% higher in New York, the agency indicated.

Analysts' Hikes Highest

While the Half survey found starting salaries only 6.3% higher than last year, it found that systems analysts experienced the highest rate of increase — with a 14.3% hike at medium-sized installations — and earned salaries of \$18,000 to \$22,000 per year.

In large installations, the increase for systems analysts was 13.9%; their salaries ranged from \$18,000 to \$23,000.

While the Half survey uncovered very small percentage changes in programmers' salaries, the National Personnel survey showed programmers' salaries jumping by a larger percentage over 1977 than the overall DP industry, with increases of 16% to 18% over last year. The National Personnel survey did not indicate specific salary rates for programmers, but it found entry-level B.S. graduates were offered starting salaries as high as \$19,200 in some parts of the U.S.

The Half survey indicated a 2.2% increase for new programmers in small installations at salaries ranging from \$10,000 to \$13,000; a 4% hike for a programmer with one year's experience in a medium-sized installation at salaries ranging from \$12,500 to \$13,500; and no change at all for programmers with one year of experience in a large installation earning \$12,000 to \$14,500.

Telecommunications and DP auditing specialists, although less in demand, also registered 1978 gains of almost 20%, according to National Personnel.

Demand Analyses

The CW survey, on the other hand, found salary increases to be fairly uniform for all job categories including managers, systems analysts and programmers.

CW's survey found demand highest for systems analysts and programmers, with the typical firm planning to hire eight or nine new people in the first half of 1978.

The National Personnel survey concurred with that demand analysis and listed demand in the following descending order: programmers, systems analysts, telecommunications specialists, new computer science graduates, accountants with computer know-how and various levels of DP managers.

(Continued on Page 12)

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County Honored for Motor Vehicle System

LOUISVILLE, Ky. — Jefferson (Cars).

County recently received a 1978 achievement award from the National Association of Counties for its County Automotive Registration System. Cars has been so successful that the system is currently being updated, with Four-Phase Systems, Inc. providing expanded capability, a county

spokesman said.

Four-Phase Systems will provide equipment for the conversion to a distributed processing environment, replacing existing IBM 3270 terminals without reprogramming the IBM mainframe, the spokesman said.

Developed in 1973 by the Metropolitan Information Services Department, Cars was enhanced in 1975 in conjunction with the County Property Valuation Assessment Officer and the Sheriff's Office.

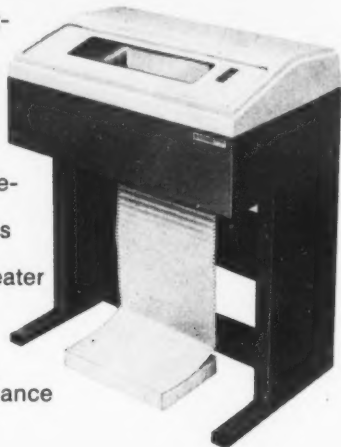
An interactive shared file data base interfaced among the county offices cooperating in the venture is a result of the four-year effort. This interface features automated personal and real property assessment functions, tax billing and collection functions and law enforcement capabilities.

County Clerk Bremer Ehrler recently directed further system development to increase overall performance and allow for expansion to a management information system operation.



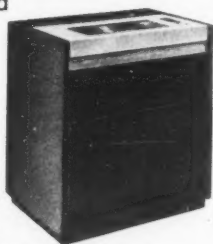
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Four Salary Surveys Agree

(Continued from Page 11)

In real numbers, demand was clearly indicated by a Department of Labor bulletin [CW, July 3] listing job openings entered by employers at the 2,500 Job Service offices in the U.S.

The bulletin suggested job openings were "excellent" for new computer science graduates.

It indicated that of 739 systems analysts openings listed from January to March, 550 remained unfilled at the end of March. Salaries ranged from \$10,000 to \$20,000.

For programmers, 2,367 jobs listed between January and March; 1,880 were unfilled at the end of March. The salary range for programmers was between \$9,051 and \$18,883.

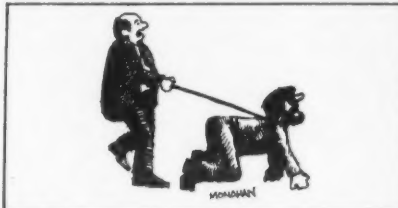
In a 1977 survey conducted by the Association for Systems Management, one of a series measuring trends of the profession over the last two decades, it was found that two-thirds of the 3,355 survey respondents had at least an undergraduate degree [CW, July 3].

Twenty-three percent had a master's

or doctoral degree and almost 40% were business majors with bachelor degrees. The survey showed there was a decrease in the number of DP personnel with no college education.

Of those without college, 50% earned at least \$23,000 per year; 66% of those with college earned that amount; and 50% of those with college earned over \$26,000, the survey indicated.

National Personnel's 1978 survey indicated the situation remained generally the same in that area one year later, with the trend away from nondegreed personnel toward people with more sophisticated backgrounds.



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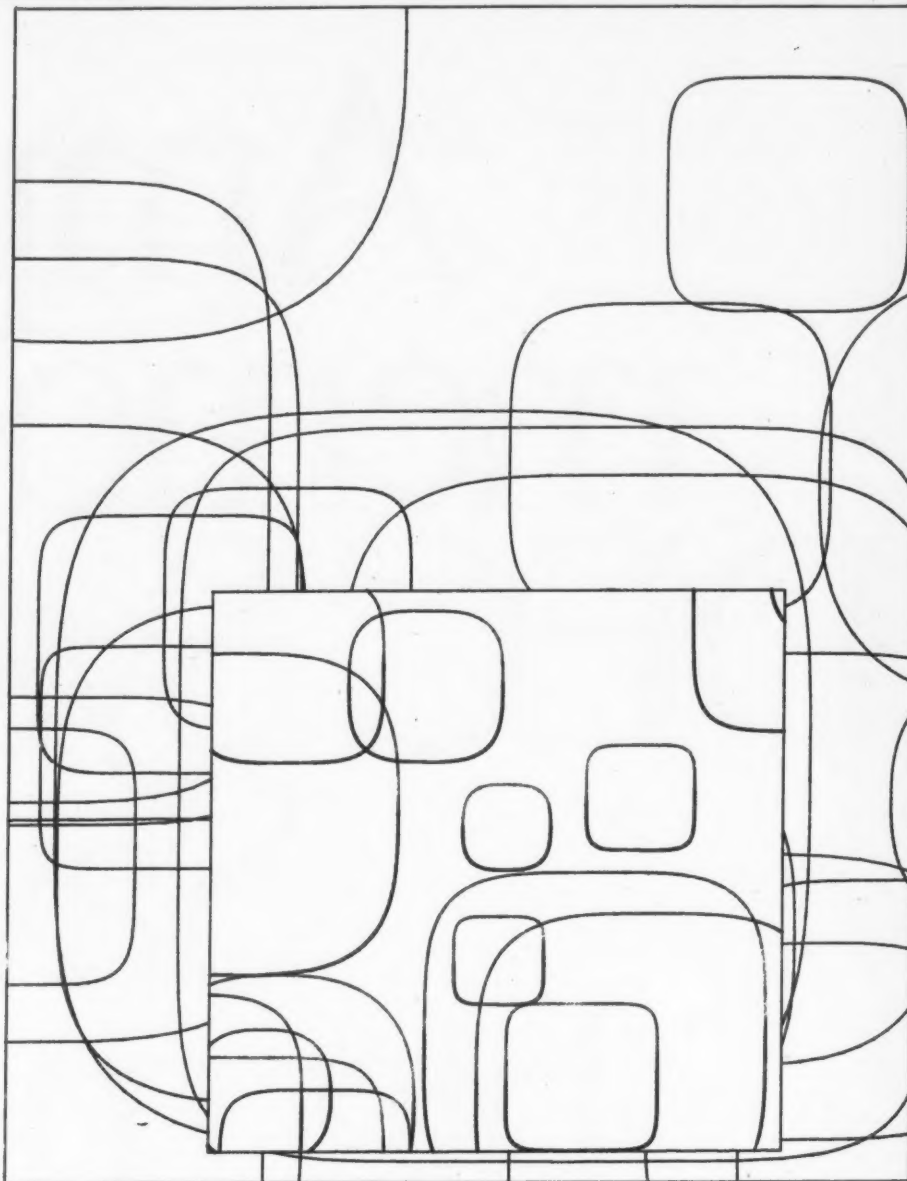
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AMPEX

Artist Can't Draw, But He Enjoys 'Round-About Process'



By Marguerite Zientara
CW Staff

SYRACUSE, N.Y. — "I don't know how to draw. I'm not a draftsman. I can't draw perspective or figures and frankly it doesn't really interest me.

"But the idea of using this kind of round-about process — clumsy and crude as it is — is one that I find myself dealing with very naturally and comfortably."

Speaking is Judson Rosebush, who teaches computer graphics and animation at Syracuse University to both artists and engineers. Rosebush also works for a New York City computer animation and consulting firm.

Rosebush was originally interested in doing motion picture work and, as a corollary, motion picture animation. "I then became interested in doing animation on a computer; I did some animation and subsequently some computer still drawings," he said. He made his first computer film in 1969-1970.

When Rosebush first started making computer drawings, he used a program called Camp written by Woody Anderson for the Air Force. "It was a good little package, but I found after a while that there were a lot of things I wanted to do that the package wouldn't do, like solid objects and mathematical transformations," he recalled.

"I was forced to start learning how to write software out of the necessity to have a package or graphics system that would give a lot of flexibility and allow a lot of creativity," he explained.

'Visions' the Result

The result was Visions, a package that was "never written with the intent it would be a commercial package," but which ultimately

became one and is available through Scientific Time Sharing Corp. in Bethesda, Md. It produces animated as well as still computer art.

Visions, used to produce every example of art presented here except "Staircase/Stairspace," is a "very simple, low-level computer graphics and animation program containing a few very simple functions," according to Rosebush.

There are two versions of Visions, one in APL and one in Fortran. "The philosophy behind it was to enable an artist to use the full power of the host language to do sophisticated animation," Rosebush noted. "Where it excels is in its very flexible syntax."

Rosebush feels Visions allows him to express many of the ideas he has about computer art. "A lot of the drawings are not just images," he said. "They involve processes as well."

In "VisionsX," for example, "the program that makes that drawing has one variable. You give the program a number — any number — and it makes a unique drawing."

"Each drawing has a bunch of letters in it, but the letters are in different spaces and have different patterns," he continued. "There is an element of building in the design process."

"I'm not saying the computer makes random art, I'm saying we're incorporating a certain amount of distribution into the making of art," he said.

Actual Process

The actual process in creating "VisionsX" involved blowing up the letters in the Souvenir Demibold font, digitizing them and then running a B-spline smoothing algorithm to smooth the curves, Rosebush explained.

The data base consisted of all the letters. Rosebush then ran a function that "determines the size and position of each letter." He imposed the restriction that small letters would always sit in front of large letters.

Once Rosebush had done "hidden surface processing" to determine which letters would obscure other letters, an 8- to 10-line APL function made the drawing as it appears here.

Rosebush sees the role of the computer in his art as basically the means of simulating and modeling "art-type processes and emotional tension." Rosebush uses the computer "to aid design or create classes of drawings."

It is extremely important for him to have a very high degree of control over an image, especially from frame to frame, in animation, which the computer affords him.

In the case of "VisionsX," however, the computer was allowed a certain amount of freedom in "deciding" how large to make the letters or where to position them. "It's like collecting thumb prints," he said. "Each one is unique."

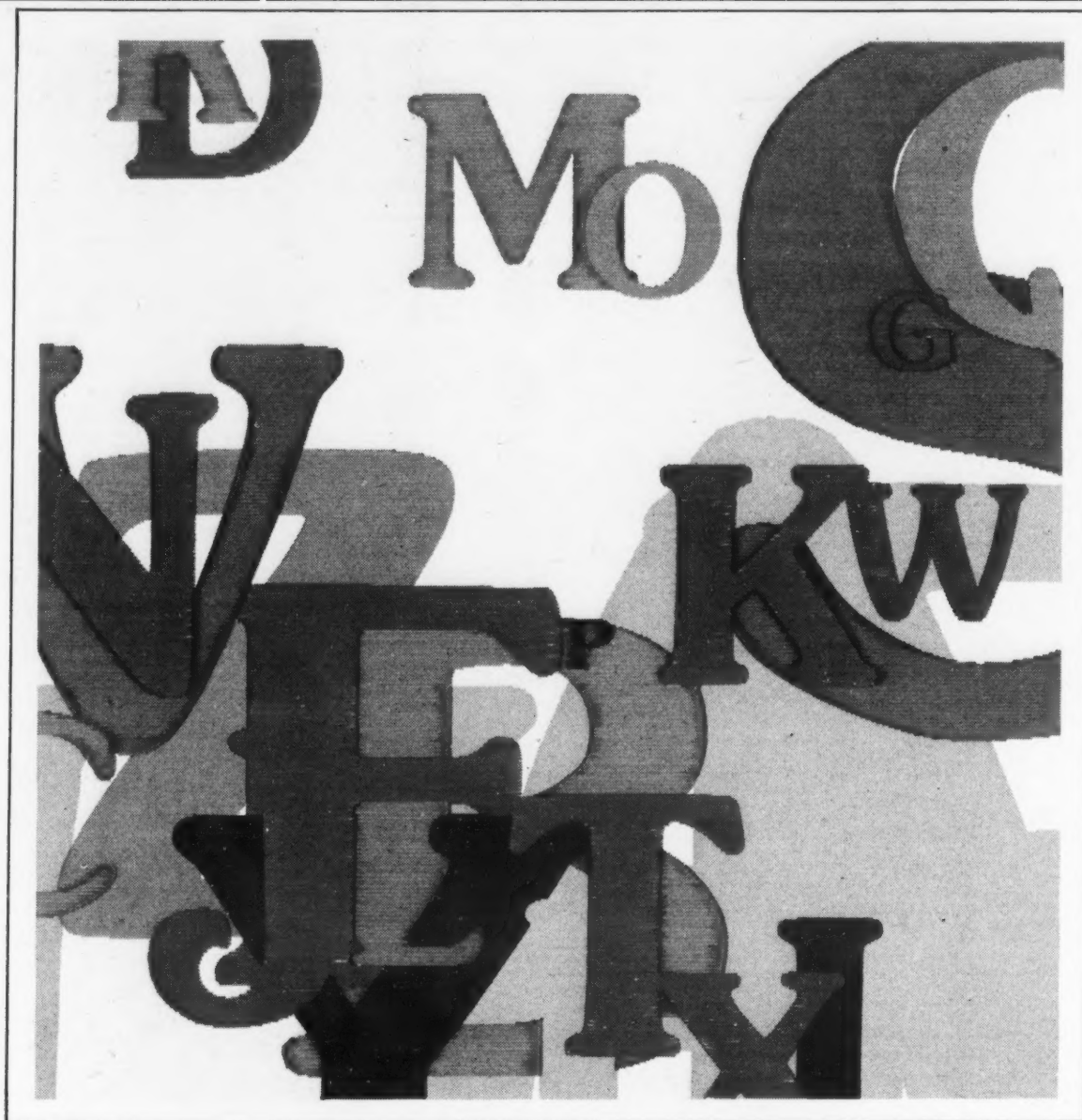
'Different Levels of Reality'

In "Paik," honoring the video artist of the same name, the basic form is the supercircle. Varying exponents determine the exact shape of each supercircle, giving some softly rounded edges and some sharper edges.

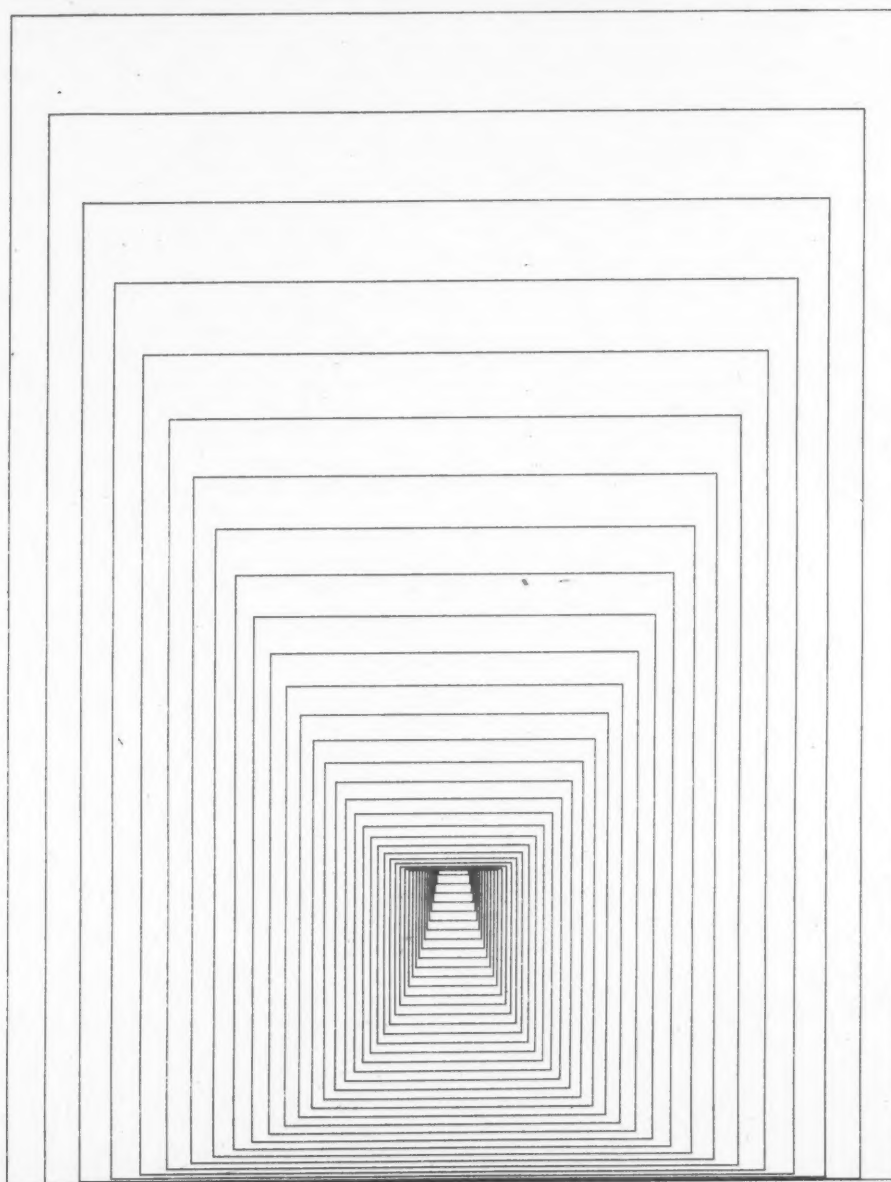
"The little box with more shapes inside suggests the idea of two spaces — an inside space and an outside space, with a transformation involved," Rosebush explained.

"When you look at the surface, different levels of reality exist at the same time. What I've done here is try to cut a little hole in the space," he said. "That done, you see there's another little space very similar to the front

(Continued on Page 16)



'Paik' (opposite) uses the supercircle as the basic form. In 'VisionsX' (above), the computer was given a certain amount of freedom to 'decide' where to position the letters and how large to make them. 'Staircase/Stairspace' (right) was developed with the help of a low-level, simple program with few functions.



Job-Matching Service Set for February Confab

DAYTON, Ohio — The Seventh Annual Computer Science Employment Register, a service that matches computer scientists and DP specialists with employment opportunities, will be conducted on Feb. 20-22 at the Dayton Computer Science Conference.

The purpose of the register, according to a spokesman, is to provide a mechanism for establishing contact in a professional manner between a DP job applicant and a prospective employer.

The applicant completes a form giving identifying information such as education, publications, experience and position and salary desired. An employer completes a similar form describing the position available.

The completed forms will be com-

piled to form four books of listings covering student applicants; nonstudent applicants; academic employers; and business, industry and government employers.

Review copies of the listings as well as personal copies (priced at \$25 each) will then be available on the conference floor. Personal copies will not include any late listings and must be ordered and paid for by Jan. 30, the spokesman said.

Registration fees for listing in the books are \$5 for nonstudents, \$10 for anonymous students or nonstudents and \$30 for employers. Individuals certified as being students by their department chairmen will be listed free of charge.

The register staff will operate a mes-

sage desk at the conference and maintain employer sign-up sheets to facilitate making contacts, the spokesman added.

Additional information on the em-

ployment service can be obtained from Orrin E. Taulbee, ACM Computer Science Employment Register, Department of Computer Science, University of Pittsburgh, Pittsburgh, Pa. 15260.

Artist Enjoys DP Process

(Continued from Page 14)

space, only slightly different.

"You could think of it perhaps as an animation where the small box might be expanding outward," he suggested.

"Staircase/Stairspace," done using Camp, is a single frame from an animated work. It represents the action a single frame takes through about two seconds.

Rosebush uses his computer anima-

tions to present nonverbal messages. "Abstract animated art shows transformations and deals with ideas as they unfold and reveal themselves," he said.

'All Art Related'

"I think all art is related in that it doesn't matter whether you use a very simple tool like a pencil or a very complicated tool like a computer," Rosebush said. "It all has a certain purpose and expression, so I think computer art is completely related to all other art."

Rosebush rarely has a final image in mind when he begins a work. "Often it's an interactive process over time," he said, comparing it to painting. "Instead of putting paint on and taking it back off, or drawing and erasing, you do it by rerunning the job."

"You have an idea and it grows," he explained. "you run the idea, look at it and say 'Maybe I should experiment with this.'"

"So you change either very specific parameters in the program, like a letter with a glitch in it, or subtle parameters, like how much freedom the program has in deciding how big or small a letter should be. You fiddle with it," he said. "That's where you have a high level of control."

Rosebush has access to several mainframes for his work. At Syracuse University he uses an IBM 370/155 with a California Computer Products, Inc. 936 plotter. Through Scientific Time Sharing, he can use an Amdahl Corp. 470; he also has access to a Digital Equipment Corp. PDP-11/03.

While Rosebush feels computer art has had a definite effect on art as a whole, he feels it will have a heavier impact in the future. "There are a lot of people who fiddle with computer art who don't have access to really good software for it, and that's a limiting factor," he said.

"I think the culture is getting used to abstract vision," Rosebush commented. "Rock'n roll music, for example, is abstract in many respects, like programmed music."

"A lot of people seem to be interested in computers because they want to play with them," he noted. "All these are forces toward creating both an appreciation of the medium, an audience for the medium and an encouragement to other people to use the medium to express themselves."

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Managers on the Move

MERVYN D. WEICH has been named director of systems and technical services at Zayre Corp. in Framingham, Mass.

A vice-president of Zayre for the past three years, Weich has also held executive posts with Raytheon Co., Transystems International and Datatrol, Inc.

Weich holds an engineering degree from Stevens Institute of Technology and completed graduate management studies at Long Island University.

CLIFFORD A. JOHNSON has been appointed manager, systems development, for Dravo Corp. in Pittsburgh, Pa.

Johnson joined Dravo in 1975 and most recently served as a project leader in the corporate systems department.

He holds a bachelor's degree and a master's degree in business administration from Kent State University.

RAYMOND C. HOUGHTON JR. has joined the staff of Bear Archery, a subsidiary of Walter Kidde & Co., Inc. in Grayling, Mich., as the DP manager.

Houghton came to Bear from Daisy Manufacturing Co. of Rogers, Ark., where he was an analyst-programmer.

His background includes more than 21 years in the computer field.

PHILIP C. CRAWFORD has been appointed systems and procedures vice-president of Houston First Savings.

Prior to joining Houston First Savings in June 1978, Crawford was vice-president and director of Capitol Computer Center.

Crawford attended the University of North Dakota.

DONALD J. MESECHER has been named management information services manager for FMC Corp.'s Drive Division in Philadelphia, Pa.

Mesecher joined FMC Corp. in 1975 at its new Construction Equipment Operation in Bowling Green, Ky. Previously, he had served as a programmer analyst and later, DP manager for a heavy duty equipment manufacturer.

Mesecher holds an applied science degree in DP from Scott Community College.

EDWARD E. POLLACK has been appointed director of computing services at Indiana University/Purdue University at Indianapolis, Ind.

Pollack joined the university in April 1977 as director of technical services. Before that, he was manager of Western computer operations for Tymshare, Inc. of Cupertino, Calif. He was also a research engineer in the Artificial Intelligence Center of SRI International.

CLIFFORD J. McRAE has been appointed vice-president of management information systems for Skil Corp. in Chicago.

Prior to joining Skil, McRae was director of information systems for Monroe Auto Equipment.

A graduate of Wittenberg University, McRae earned a bachelor's in management science from the Case Institute of Technology and a master's in business economics from Xavier University.

RAYMOND M. REILLY has been named senior systems analyst for Airco Industrial Gases Division of Airco, Inc. in Murray Hill, N.J.

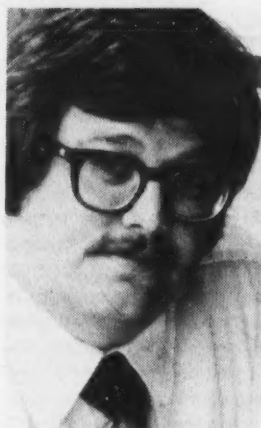
Reilly joined Airco in 1967 as a data control analyst.

He received his B.S. in management science from Kean College, Union, N.J.

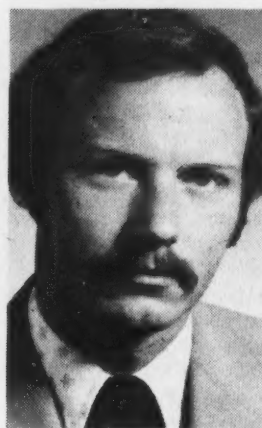
JAMES FRAME has been appointed director of programming for International Telephone and Telegraph Corp. in New York.

He was formerly director of IBM's Santa Teresa Laboratory in San Jose, Calif.

Frame is a graduate of St. Johns College, Annapolis, Md.



Mesecher



Johnson



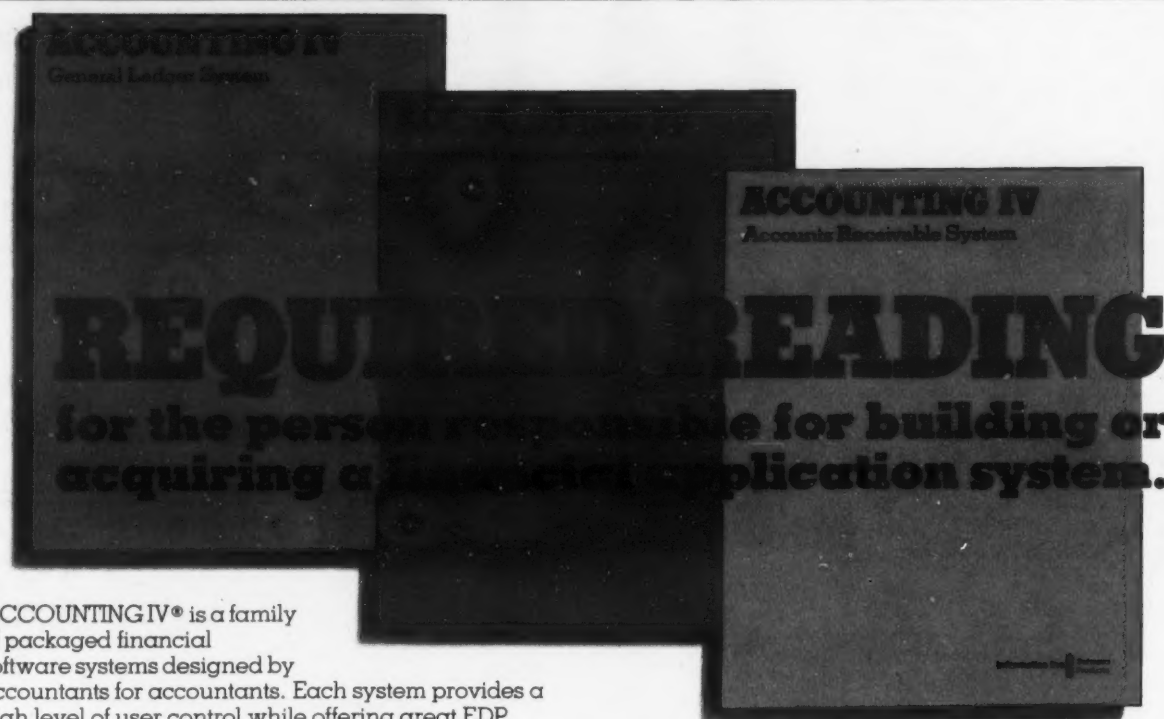
Weich

JOHN PAUL MUSINSKI has been promoted to night manager of *The Washington Post's* DP operations.

Musinski joined *The Post* in 1973 as a computer operator. He was promoted a year later to senior operator and then

to business systems programmer. In 1976 he was made a programmer/analyst in the Systems Programming Group.

Musinski is currently working on his degree in computer science.



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Mini Improves Pollsters' Interview Methods

By Tim Scannell

CW Staff

LOS ANGELES — Like those people who strive for an improved mousetrap or more quality in a 10-cent cigar, researchers here at the University of California at Los Angeles (UCLA) have designed and developed what they think is a better way to conduct public opinion polls.

Pollsters from the university's Survey Research Center, working with several UCLA scientists, recently telephoned 30,000 area residents and used a minicomputer to supplement their standard pencil and paper method of recording peoples' views. The system not only registered each answer as it was given, but also supplied the interviewer with logical follow-up questions and shifted, when necessary, from one language to another.

The poll focused on identifying California's population of disabled citizens. Interviewers called each participant on the telephone, asked various questions and keyed in that person's answers on terminals that were linked to a Digital Equipment Corp. PDP-11. In each case, the answers were "yes" or "no" or multiple choice.

The computer, in turn, stored and immediately correlated each individual's answers.

Researchers also programmed the system to keep track of any unanswered telephone numbers and transfer them to a separate list of future "call-backs."

Provides Quality Control

The most obvious benefit of using a computer in the polling process is that it maintains a certain amount of quality control over the interview, according to Dr. Howard B. Freeman, director of UCLA's Institute for Social Science Research. "The computer treats the interview schedule simply as a set of questions

that appear on the terminal screen" and from the respondent's answers skips to a set of "logical contingencies."

For instance, Freeman explained, the computer wouldn't question a 14-year-old about his involvement in World War II.

Computer-assisted interviewing also allows managers to direct their polling staffs more effectively. "A supervi-

sor can sit with a set of terminals or screens and watch the progress of the interview," Freeman pointed out, and exercise control over the various "consistencies and inconsistencies" that might occur.

The state officials or private agencies that conduct polls and opinion sampling surveys can also benefit from using a computer in their studies, since many additional expenses are eliminated by the

computer's speed and programming. For example, a system programmed to ask and accept questions in another language does away with the need to find and hire — usually at an extra cost — bilingual interviewers, Freeman stated.

Finally, because of its speed and programming flexibility, the system allows the interviewer to conduct a great deal more interviews. This, of

course, lowers the error factor that's built into every sampling, Freeman said.

Surprisingly, very few of the interviewees in UCLA's poll actually minded that a computer was being used to record their opinions, Freeman observed. "We do tell the person being interviewed that a computer is used because they hear a slight noise as the [terminal's] keys are depressed."

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Eppley to Chair Board of EFTA

LAKE SUCCESS, N.Y. — Roland R. Eppley Jr., president of the Eastern States Bankcard Association (ESBA), Inc., has been elected the first chairman of the board of governors of the Washington, D.C.-based Electronic Funds Transfer Association (EFTA).

EFTA is a nonprofit organization that provides an interindustry forum for financial institutions, consumers and all other potential EFT users. The association's membership addresses such EFT-related areas as proposed legislation and regulation, technological alternatives and relative education.



CW Photo by A. Dooley

Cleveland Grossett learns 'at his own pace in his own space' at test installation in Burlington, Mass.

Brief Stint at DP-Based Learning Increases Illiterate Adults' Skills

By Ann Dooley
CW Staff

BURLINGTON, Mass. — A group of functionally illiterate adults here advanced an average of one or more years in reading and math comprehension after only a short exposure to a computer-based education system.

In most cases, the students using the Basic Skills Learning

(BSL) program developed by Control Data Corp. for its Plato system spent only seven to 13 hours at the terminal supplemented by a few hours of outside study, according to Peter Rizza, CDC education consultant.

The BSL system is intended to help the 23 million American adults who lack basic reading and math skills to

progress to an eighth grade education, Rizza said.

The program has been tested in eight basic skills learning centers around the country, most of which were prisons, correction centers, schools and adult education centers. More than 600 students participated in the test phase of the program, geared for students 16 to 24 years old.

The program covers math, reading and language skills for grades four through eight. Almost 75% of the learning is performed in conjunction with the Plato system and the rest is accomplished through outside study.

Small Dropout Rate

"The implications of the test results are far-reaching," Rizza said. "The early results reveal students are extremely motivated when using the Basic Skills Learning system ... the dropout rate in other remedial programs for functionally illiterate adults reaches as high as 50%. The dropout rate for our program is less than 5%."

The need for this sort of program is critical — for example, Florida, which has a minimum competency test, has found 36% of all students scheduled for high school graduation could not pass their minimum competency in math, Rizza said, noting Florida schools are scheduled to begin the math program this fall.

The BSL system is a recent addition to the two-year-old Plato system — a system that offers self-paced individualized instruction covering a broad range of education and training needs.

One of the main reasons for the high interest in the Plato system among students is that it can display lesson materials on a CRT in the form of animated graphics, drawings or text; students can communicate with Plato through the keyboard or by pressing a fingertip on the terminal screen for instant response.

Students answer questions, make choices and ask for help with these two methods of communications. Plato responds in the affirmative or negative or provides additional instruction and help.

A CDC Cyber 73 mainframe with 2M words of extended core storage memory is used which enables the system to respond in less than .2 seconds. Plato is also compatible with any of CDC's Cyber 70 or 170 series computers.

The Plato terminals incorporate a plasma display panel, an electronic keyboard, a local or remote communications interface and associated electronics. Magnetic disks are

(Continued on Page 20)

Most engineers and scientists will find all the power they need in this new leader of the HP 1000 family. A new floating point processor handles big data arrays and cuts lengthy computational problems down to size. And the HP 1000 Model 45 also has the flexibility for complex measurement and control applications, for data base management and distributed networking.

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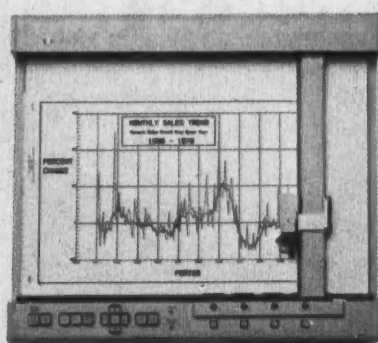
A special scientific instruction set, standard in the system, also helps to improve execution speed, performing trig and log functions in less than 48 microseconds. And a fast FORTRAN processor, which

handles commonly used FORTRAN operations in hardware, also gets things done in a hurry.

Our RTE-IV real-time operating system, the latest in an upward compatible family, lets you manipulate data arrays up to 1.8M bytes, using simple FORTRAN commands. As many as 64 partitions, with a program capacity of 54K bytes, can be resident in memory at the same time.

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In addition to getting graphic displays on the 2648A terminal, you can get hard copy graphics on our new 9872A programmable four-color plotter, one of many options available with the HP 1000 Model 45. It has a built-in microprocessor and operates up to 360 mm/s (14 inches/s) on each axis. Ideal for vector analysis trace differentiations and window plotting.

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M.S. in Records Management Offered

WASHINGTON, D.C. — A master's program in records management will begin this fall at American University's Center for Technology and Administration (CTA) here. The program was established for records managers in business, government and educational organizations who must cope with advancing technology and growing complexities in administration.

The specialization is part of CTA's Master of Science in Technology of Management program, designed to apply contemporary technology to management in the public and private sectors.

Other specializations include computer systems applications, management information systems and scientific and technical information systems.

The program was designed with the aid of Col. Seymour J. Pomrenze (Ret.), an adjunct professor who served as key records manager with the National Archives of the U.S. and the U.S. Department of the Army for more than 35 years.

Further information on the program is available from CTA, American University, Hurst Hall 206, Washington, D.C. 20016.

Brief DP Experience Brings Boost in Illiterates' Skills

(Continued from Page 19)

used for storage. The system also incorporates an audio device and hard-copy printers for alternative input and output methods.

A touch input device so the student can communicate by the touch of a finger on the screen and full-color microfiche image projection are also available.

The curriculum for the BSL

system is a composite of materials developed and adapted to a computer-based format by educators in the field, according to CDC. The resulting program consists of information organized into a modularized system encompassing basic number concepts, basic arithmetic operations involving numbers, fractions and decimals and special application topics such as ratios, proportions, percents, geometry and measurements.

Other educational areas covered include basic fundamentals of word structure, fundamental vocabulary development, basic comprehensive skills, basic language structure and word usage, sentence and paragraph structure and mechanics and conventions in writing.

Low Motivation Addressed

The students in the program usually have little motivation and low self-confidence because of prior learning experiences, but the BSL program addresses that problem by individual and immediate feedback, small, well-defined modular units, clear-cut objectives and mastery goals, CDC said.

In addition, each student's skills are assessed before beginning the program to determine his individual level, and all the information is presented in a multimedia support format, an approach often successful with students who have had problems with text-oriented environments, Rizza said.

The work pace is designed to give students a sense of accomplishment and continual progress, Rizza noted.

The course material is composed of tutorial lessons, drill-and-practice lessons, remedial help sequences and review, diagnostic, memory and retention tests as well as visual materials and manuals.

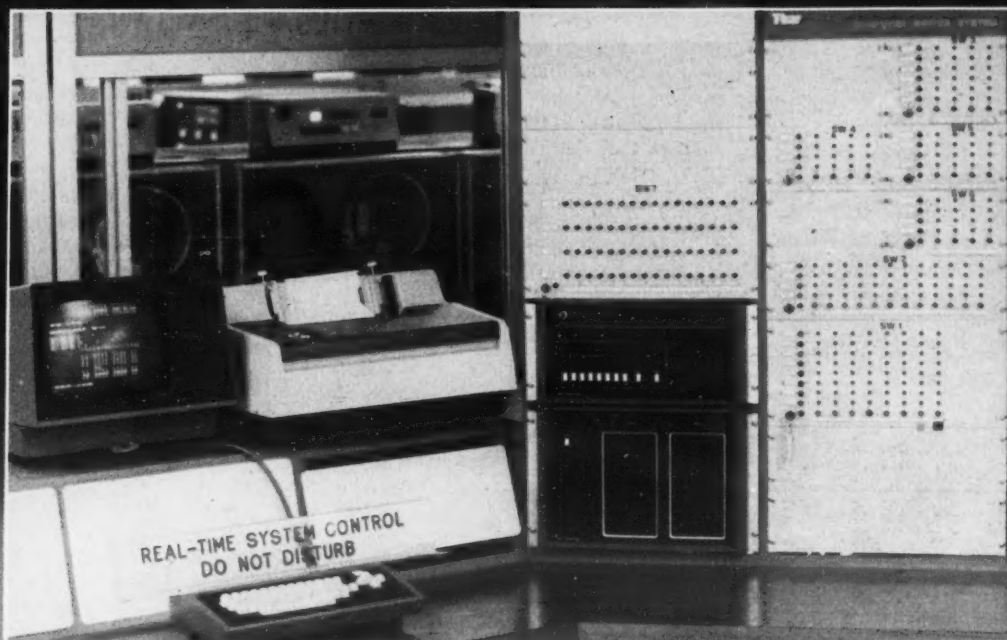
A beginning student logs onto the system with a password, learns how to operate Plato and is then given a pretest of the material that is to follow in order to determine the extent of his current knowledge. If a student misses a certain number of questions at a prescribed level of difficulty, he is routed to that section of the curriculum.

The student next has the choice of taking a more specific pretest, starting the lesson or even signing off. When the student signs on again, the system will indicate where he left off; he can either review the material or proceed with the lesson.

The Plato system is programmed to indicate to the instructor how well the student is doing or even if he needs special help and guidance.

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Soviets Using Hungarian Minis in Network

By Ivan Berenyi

Special to CW

TUMEN, USSR — Six Hungarian-built minicomputers are being used in a hierarchical process control network to automate production at the Soviet Union's oilfield here in western Siberia.

The system is a pilot project for future developments in oil production, the scale of which will warrant more than 100 Videoton Computer R-10 minis and almost 1,000 microprocessor-based intelligent terminals by the beginning of the 1980s in the Tumen region alone.

The six R-10s here at Tumen are interlinked by a combination of telephone and microwave lines over distances of up to 600 kilometers. Each supports up to 20 to 25 Videoton VTS-56100 intelligent terminals, based on Intel Corp. 8080 microprocessors.

The terminals are individually addressable by each of the minicomputers. This master-slave configuration operates under the control of a large East German-built Robotron R-40 mainframe at the oilfield's administrative center.

The system monitors and records both the quantity and quality of the oil being pumped from each well, captures and processes operational data, maintains a data base on oil sales from the field and processes geological data for future research projects.

It also has a lengthy diagnostic routine built in to cope with failures resulting from the arctic weather conditions the terminals have to withstand.

Good Customer

"The Soviet energy industry has always been a good customer for Videoton Computer," according to commercial director Dr. Csaba Barath. "But in the oil area we only started deliveries two years ago. Volume became substantial last year and now oil is becoming a huge computer user — the biggest Videoton has ever had, in fact."

Barath's personal view of the future of process control computing is that "hierarchical processing is the future trend. Direct process control tasks are bound to be increasingly delegated to micro-supervised, application-specific endstations."

"These process-oriented terminals will be linked more and more to minis and megaminis, which will exercise supervisory control. They will also provide a link to other processing areas — commercial processing or data base work," he added.

Videoton's big follow-up order to the Tumen project involves uniting several small oil and gas fields in the Moscow

area into one production control network. It is the clearest indication yet that the R-10, which is based on French specifications, has become the process control workhorse of Eastern Europe.

The Hungarian machine is credited with being the most reliable of the Comecon Riad range, a reputation which has made it popular with other advanced technology users. It is widely used, particularly in

the USSR, for applications in nuclear physics, both in research establishments and nuclear reactors.

Nuclear Applications

A total of 26 R-10s have been sold to the Russians for nuclear applications, with more than half going to the Dubna Institute, which is financed and run by all the East European countries. These minis are used primarily for

mass spectrographic analysis and other high-volume measuring tasks, but at least 10 are in use for a variety of applications at Moscow's Kurchatov reactor complex.

Some are used for reactor control, some for mass spectrography and five for plasma measurements.

'Early PDP-8'

Another Hungarian minicomputer, the little known

TPA/I, is also used at the Dubna Institute and other Russian research establishments.

Resembling somewhat an early Digital Equipment Corp. PDP-8, it was developed in the early 1960s by Hungary's Central Research Institute for Physics to replace cumbersome multichannel analyzers for a number of high-volume monitoring and basic control tasks.

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Calendar

Oct. 15-17, Kiamesha Lake, N.Y. — **13th Annual Conference on Computers in Education — Who's Doing What?** sponsored by New York State Association for Educational Data Systems (Aeds). Contact: Joseph E. Nove, Boces, No. 2 Suffolk, 201 Sunrise Highway, Patchogue, N.Y. 11772.

Oct. 15-18, Denver — **Common Fall '78 Conference.** Contact: David G. Lister, Administrative Director, Common - Department F3, Suite 1717, 435 N. Michigan Ave., Chicago, Ill. 60611.

Oct. 15-18, San Diego, Calif. — **Cooperative Health-Care Users Group (Chug) Meeting.** Contact: Stathis Alatis, Chug Secretary/Treasurer, Weirton General Hospital, St. John's Road, Weirton, W. Va. 26062.

Oct. 16-17, Los Angeles — **Planning and Initiating the Data Base System,** sponsored by Performance Development Corp. (PDC). Contact: PDC, Bldg. M, 1101 State Road, Princeton, N.J. 08540.

Oct. 16-17, San Francisco — **Minicomputers and Small Business Computers: Selection and Usage Guidelines,** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 16-17, San Francisco — **Understanding Proprietary Software and How to Buy It,** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 16-18, Los Angeles — **Data Processing Operations Management,** sponsored by the University of Chicago Center for Continuing Education. Contact: University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Oct. 16-18, Chicago — **Control of Material Flow,** sponsored by the University of Chicago, Center for Continuing Education. Contact: University of Chicago, Center for Continuing Education, 1307 E. 60th St., Chicago, Ill. 60637.

Oct. 16-18, New York — **International Security Conference — Eastern Workshops,**

Contact: International Security Conference, 2639, S. La Cienega Blvd., Los Angeles, Calif. 90034.

Oct. 16-18, Madison, Wis. — **1978 Lightning Conference: Surge Protection of Electronic and Telephone Equipment,** sponsored by the University of Wisconsin. Contact: Willis F. Long, Department of Engineering and Applied Science, University of Wisconsin-Extension, 432 N. Lake, St.,

Madison, Wis. 53706.

Oct. 16-18, Washington, D.C. — **Data Processing: An Introduction to Concepts and Systems,** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 25-27 in Chicago.

Oct. 16-19, Denver — **Project Management,** sponsored by AMR International, Inc. Con-

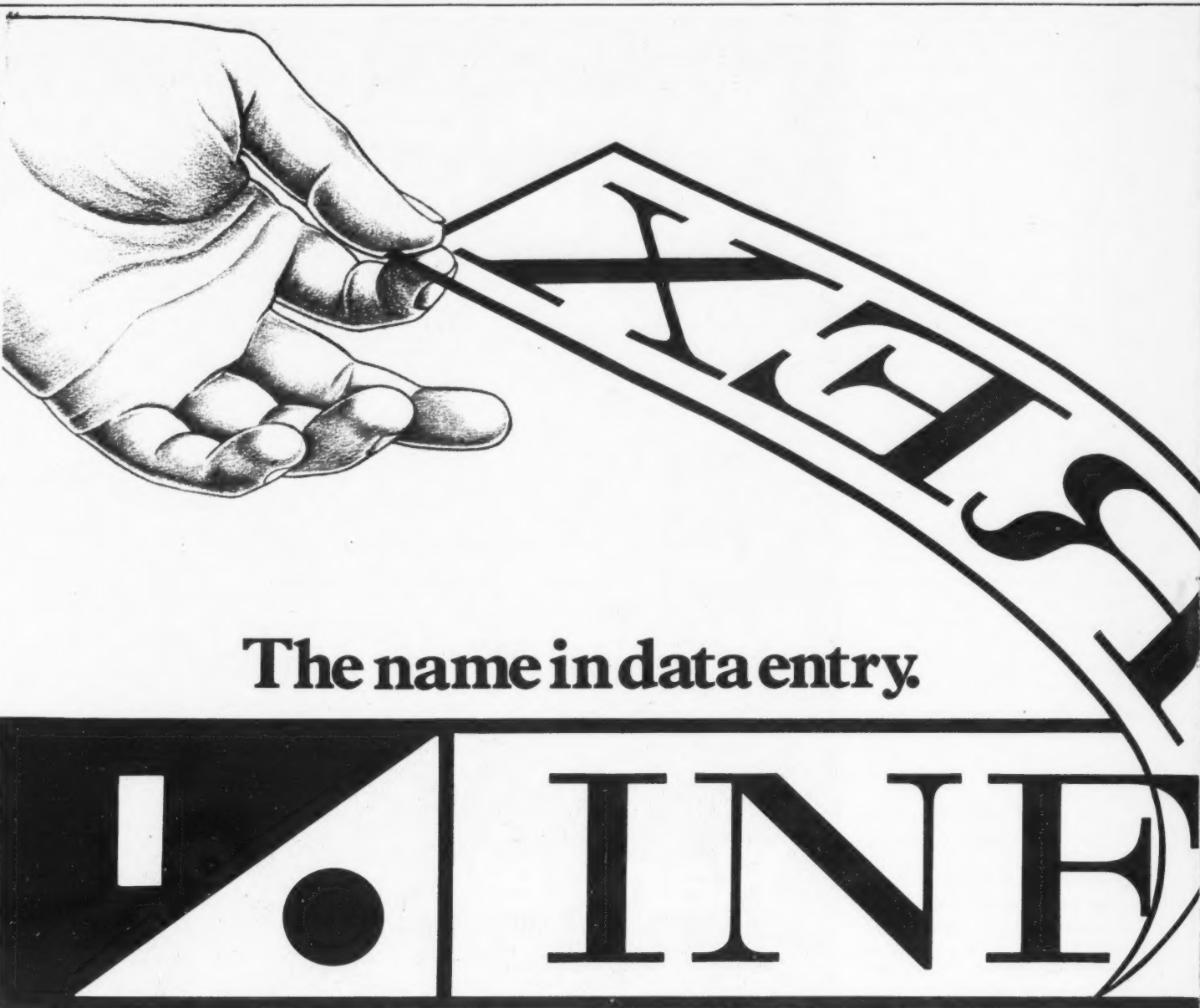
tact: AMR International, 1370 Ave. of the Americas, New York, N.Y. 10019. Also being held Oct. 24-27 in San Diego, Calif.

Oct. 16-19, Chicago — **Information Management Exposition and Conference,** sponsored by Clapp & Poliak, Inc. Contact: Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10017.

Oct. 16-19, New York — **Graph Expo '78,** co-sponsored

by National Association of Printers and Lithographers and Printing Industries of America, Inc. Contact: Graph Expo, 570 Seventh Ave., New York, N.Y. 10018.

Oct. 17, Hartford, Conn. — **Minicomputer Symposium,** sponsored by the Greater Hartford Chapter of the EDP Auditors Association. Contact: Jerry Burge, 150 Windsor St., Hartford, Conn. 06115.



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Calendar

Oct. 17, Springfield, Va. — **National Capital Area Chapter of EDP Auditors Association Fifth Annual Regional Seminar.** Contact: Virginia B. Crawford, First American Bank of Virginia, 1970 Chainbridge Road, McLean, Va. 22102.

Oct. 17, Waltham, Mass. — **Closing the Loop: A Manufacturing Seminar,** sponsored by Xerox Computer Services. Contact: Bill Wehrheim,

Xerox Computer Services, 350 Jericho Tpke., Jericho, N.Y. 11753. Also being held Oct. 18 in Norwalk, Conn.

Oct. 17-19, London — **Ecoma-6 Conference,** sponsored by the European Computer Measurement Group (Ecoma). Contact: Scott N. Yasler, President, Ecoma, Scheuchzerstrasse 5, CH-8006, Zurich, Switzerland.

Oct. 18-19, Los Angeles —

Fall Data Base Seminar Series, sponsored by Performance Development Corp. (PDC). Contact: PDC, Bldg. M, 1101 State Rd., Princeton, N.J. 08540. Also being held Oct. 30-31 in New York.

Oct. 18-20, San Francisco — **Distributed Systems: Are They Right for You?** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood

Blvd., Delran, N.J. 08075.

Oct. 23, Washington, D.C. — **Computer Reminiscences 54: Federal Involvement,** co-sponsored by the Washington Chapters of the Association for Computer Machinery, the Data Processing Management Association, the IEEE Computer Society and the Division of Mathematics of the National Museum of History and Technology. Contact: Joseph H. Easley, Program Chairman,

401 M St. S.W., Washington, D.C. 20460.

Oct. 23-25, Chicago — **Data Base Management Systems: General Concepts and Planning Guidelines,** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held Oct. 30-Nov. 1 in New York.

Oct. 23-25, San Francisco — **Increasing DP Usage and Benefits Through Organizational Communications,** sponsored by Datapro Research Corp. Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 23-24, Newport, R.I. — **Marketing Seminar on Fiber-Optic Communications,** sponsored by Kessler Marketing Intelligence. Contact: Kessler Marketing Intelligence, 22 Farewell St., Newport, R.I. 02840.

Oct. 23-25, New York — **Inquire Users' Meeting,** sponsored by Infodata Systems, Inc. Contact: Carole McDavid, Coordinator, Infodata Systems, 5205 Leesburg Pike, Falls Church, Va. 22041.

Oct. 23-27 Rio De Janeiro — **11th National Data Processing Congress,** sponsored by the Brazilian Society of Computers Users. Contact: Raul Isiris, Chairman, Sucesu Nacional, Rua de Carmo 57-69, Andar, Rio de Janeiro, Brazil.

Oct. 24-26, Boston — **Laser Beam Information Systems,** sponsored by the University of Chicago. Contact: Heidi E. Kaplan, Department 20 NR, New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Oct. 24-26, St. Louis — **International Word Processing Association (IWP) Annual Fall Symposium.** Contact: IWP Membership Services, Maryland Road, Willow Grove, Pa. 19090.

Oct. 24-27, Boston — **Cpeug '78 Meeting on ADP Life Cycle, Federal DP Reorganization and Future of Computer Performance Evaluation,** sponsored by Computer Performance Evaluation Users Group (Cpeug). Contact: Carol B. Wilson, Building 25, Room A-265, National Bureau of Standards, Washington, D.C. 20234.

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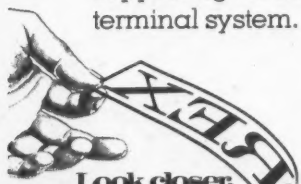
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Editorial

Microcode: Help or Hindrance

The proposition that IBM is using microcode as a marketing tool should not have come as a great surprise to users and other vendors.

The two-part series authored by Charles A. Cornell of IPL Systems, Inc. put forth that proposition as well as the thesis that IBM may even be abandoning its upward compatibility features across the 370 line [CW, Aug. 28, Sept. 4]. While varied microcode implementations on differing 370 CPUs may indeed be only an interim measure, there is little doubt this gives IBM tremendous latitude.

It must be recognized that IPL Systems is in the plug-compatible mainframe business and will not hesitate to expound on the benefits of its own products. Nevertheless, microcode features can be a severely limiting characteristic.

Although IBM has not yet used microcode as a device to lock in users to a particular CPU, the threat exists. However, providing upgrade paths to larger mainframes makes sense for the company, so it is doubtful users will lose their upward mobility within the IBM CPU line.

Another fear voiced by Cornell — that microcode can affect the operation of plug-compatible CPUs — is also very real. Users who elect to install a non-IBM system to replace a 370 assume certain risks, but vendors of plug-compatible machines realize a painless transition from

an IBM operating system to their CPUs makes for a satisfied customer.

Perhaps a more intangible factor would keep IBM from lowering the microcode boom. The vendor has had its share of lawsuits, even though it has so far emerged unscathed.

In view of the endless suits filed against its marketing strategies, it seems unlikely IBM would flagrantly use microcode routines to limit either users or vendors.

Despite these reservations, Cornell pointed to some very real problems for users of all types of CPUs. The old days when operating system problems could be solved through conventional programming approaches no longer exist now that certain routines reside in microcode.

It is unfortunate that advances in technology have also lessened the user's ability to exercise control over his system. Users considering the acquisition of new systems should carefully explore the limiting factors associated with microcode routines.

One thing is common to all vendors: They do not readily divulge these types of limitations, and only an insistent user will get the needed information.

Microcode can be a help or a hindrance. Some shrewd questions up front could save a lot of aggravation later.



Letters to the Editor

Bank's Security the Problem

Though a recent article on the "\$140,000 Fedwire theft" [CW, Aug. 14] focused on Fedwire security, the fraudulent instructions involved were successful because of a breach of the initiating corporation and/or bank's security — not the Fedwire's.

The article failed to identify clearly the difference between the need for security in the corporate-to-bank interchange (whether voice or automated interface) and that in the bank-to-bank delivery mechanism.

The author should have elaborated on corporate to bank security, rather than Fedwire security, consistent with the article's basic thrust. Instead, the erroneous impression may have been created that Fedwire security could have or should have prevented the theft.

Stephen Bander

New York, N.Y.

Typical Government Solution

After reading "Federal, Private DP Share Development Woes" [CW, Aug. 21], I can only conclude that the team put together to "study" bureaucratic bungling in the federal government's DP function was made up of more lamebrained bureaucrats.

Their recommendations for overcoming the mess incompetent management has created?

- "Establishment of a quality control function." Sure, let's enlarge an already over-fat organization and staff it with more incompetents to make sure the other incompetents do what they are getting paid for!

- "Use a structured process with certain minimum standards for system development and the management of system projects." Although little I hear these days about the operation of the federal government surprises me, I am flabbergasted

that such a recommendation has to be made at all.

- "A central consulting function should be established." A bureaucrat's dream. Let's establish yet another bureau to advise those with "marginal technical skills" how to do their job.

- "Bonuses should be given for projects brought in on time and within budget, for positive budget performance." You have got to be kidding! A bonus for doing your job properly? Where I come from, if you don't do your job properly, you start looking for another job. Obviously not the case in our fat-cat bureaucracy.

Here we see once again the government's solution to incompetence: hire more people and waste more money.

Barry M. Walden

Portland, Maine

Correct Equivalent

"Search for Accuracy Shows CPU's Limitations" [CW, Aug. 21] contained an error near the bottom of the first column. It was stated that .31416E01 is equal to 31416 times 10** (1/4). The intended expression is probably 31416 times 10** (-4). Fortunately, a mistake of this magnitude is much less detrimental to this interesting and informative article than it would be to a numerical algorithm.

Garth Peterson

Sioux Falls, S.D.

Reader Peterson is certainly right. In fact, a correction appeared in the Sept. 4 issue. Ed.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

Data Past

Five Years Ago Sept. 12, 1973

OVERLAND, Mo. — As fire raged through the U.S. Military Personnel Records Center here, the center's chief took heroic action to salvage the DP installation. The chief of the first-floor Federal Data Processing Center rushed in and covered the CPU with a plastic sheet, plucked the disks from a five-spindle IBM 2314 disk drive and grabbed the master program files before they could be destroyed. The blaze threatened the personnel records of 26 million past and present members of the U.S. military.

ATLANTA — The council of the Association for Computing Machinery (ACM) officially adopted a strong code of professional ethics for members of the DP community, but shied away from writing any strong enforcement procedures into its bylaws. At its meeting here following the ACM '73 conference, the council agreed to adopt the code, without the enforcement provisions, by a vote of 15 to 4 with three abstentions. The ACM membership had previously amended the ACM constitution to call for a code of ethics and enforcement procedures by a vote of 4 to 1 of the membership at large.

Eight Years Ago Sept. 16, 1970

CHERRY HILL, N.J. — An updated version of RCA Corp.'s Time-Sharing Operating System (TSOS) was said to give Spectra 70/46 users four times the performance of previous TSOS packages. According to RCA, TSOS-Version 6 was the most comprehensive software package of its type ever developed. The company claimed that the software brought the capabilities that RCA and other mainframe manufacturers had been trying to build into time-sharing systems for years.

NEW YORK — The ACM agreed to study the case of, and possibly aid, a black programmer who had been in jail awaiting trial for 17 months because he was unable to raise \$50,000 bail. Clark Squire, 33, was one of 21 Black Panthers charged in an alleged bombing conspiracy but was arrested before any bombings could take place. Herbert R.J. Grosch, an ACM Council member who suggested the study, declared: "A white man with the same job and same charge would have been released on much lower bail." He asked the ACM to act because "we must consider the welfare of all members of our guild without consideration of color and politics."

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COMPUTERWORLD

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The Human Connection

DPers Can Learn Special Art of Sharing

By Jack Stone
Special to CW

You may remember reading the letter from Painter Hoffman in this column last year [CW, Aug. 8, 1977]. She expressed with great sensitivity her feelings about marriage and subsequent "disconnection" from a "computer man."

She has written again, this time reflecting on communications in the home of the professional person and what she believes is needed to build productive personal relationships.

Dear Jack:

About a year ago I wrote a letter to you describing some of the unhappy experiences I had as the wife of a computer person. In my letter, I raised the question: Is it the inherent nature of the computer man to be indifferent to the sights and sounds of life or is it the computer that dehumanizes the man? I still don't know for certain.

I only know my life was sad because of my husband's preoccupation with his job and his seeming apathy toward all things special or exciting to me. I was lonely and, sadly, I became disconnected.

But it's okay. Today, I have many wonderful friends, an exciting ca-

reer and oftentimes happiness. I do, however, still believe in marriage for many reasons. I feel it can provide a structure, a continuity and a secure base for children where love and happiness can indeed exist. And I had this structure: a beautiful, white house in the suburbs; happy kids; a hardworking, loyal husband; and even a little love.

Presumably, these were all the right ingredients of a "good marriage." But they really weren't! And I didn't know why or how to improve my situation.

Now I know there must be a catalyst to hold this structure together. Simply existing together, although comfortably familiar, is not enough. And loving each other is not enough. There has to be something stronger, something more powerful to hold a man and a woman together in love.

I don't profess to know all the answers, but I'm beginning to discover some of them and it's very exciting to me. Let me tell you what I've found. It's so simple.

It's sharing — sharing thoughts and ideas and experiences with someone who cares and listens. It's listening and caring, in turn, to what the other says and does. It is simple, but it's not easy because it

takes time and effort, and it must be genuine and continuous.

I know a special man. He is my father's business friend, and he owns a very large manufacturing company in Chicago, which he developed into a successful and powerful corporation. He has always been an extremely active, ambitious and vital man. Yet, he never fails to spend time with his family.

Each day when he comes home from work, he spends about a half hour of the early evening in his study, alone with his children. He tells them about his extruders and his big deals and the problems he has with his staff, and they tell him about cub scouts and school and the problems they are having with their friends.

There may be 20 people at his house for a dinner party, but he always keeps the appointment with his kids. His guests simply wait for him.

The late evenings are exclusively reserved for his wife.

This man not only has a love for his family, he demonstrates it. He knows love is an active word.

He's in his 60s now and still very energetic. When I last saw him, he took me to lunch in a lovely restaurant high above Chicago's Loop and

talked to me about my father. He also asked me about myself. I couldn't help but love this man.

A wonderful way to open a conversation with a friend is to say, "Tell me everything that's happened since we last met!" And then listen and respond and remember what is said.

Through this continuous sharing of everyday experiences you can learn almost everything about a person — his joys and fears and his feeling about others — so you don't have to sit down once a month and say, "What are you feeling?" because you already know.

In order to love someone you must know the person. Don't you see? Sharing is the catalyst that brings a man and a woman together in love. That's what I've learned.

People in all professions tend to become too involved with their own lives and fail to communicate with their loved ones. But I believe anyone — even a computer person — can learn how to share.

Painter Hoffman

McLean, Va.

Letters to Stone should be addressed to him at Suite 222, 2233 Wisconsin Ave. N.W., Washington, D.C. 20007.

The Taylor Report

UK's TV Viewers Access DP-Generated Magazines

By Alan Taylor
Special to CW

What may sound like a futuristic fantasy is now a standard operating procedure in England. The independent TV station and two state TV channels are sending various "magazines" to viewers.

The computers involved are not unusual. One is a Digital Equipment Corp. mini made in Ireland, and the other is a General Electric Co. mini produced in North London. And the software for input is quite routine; it includes text editing and formats 960 character pages arranged in 24 lines.

But the output software is unusual.

Data is sent to television transmitters in 10-bit envelopes with even parity. The data is transmitted above the standard television picture at the rate of four lines per TV frame or 100 pages every 25 seconds. It can be picked up with modified TV sets, and the user can call up any of the 100 pages with an average access time of 13 seconds.

The content of these magazines has become somewhat standardized. A "news flash" type outlines traffic conditions, weather, sports and entertainment. In addition, special reports containing farm news and meat, fish and

vegetable prices are presented. Regional editions are also being planned.

The current TV circuitry changes are almost handmade, as industry is just beginning to produce specially designed integrated circuits. In the stores, converters cost about \$600, but prices are dropping. The most recent wholesale price quoted to me for a converter is less than \$150.

Reduced Access Time

Converters are expected to bring down access time considerably. At the moment, converters have no memory, and each time a viewer accesses a new page, he has to wait an average of 13 seconds. The new designs include integrated memories that can hold up to four pages in reserve.

The capacity of the system is substantially increased since articles are usually read sequentially, and the first page takes about 25 seconds to read. The technique allows second and third pages to be transmitted alternately.

For instance, a transmittal order of pages 1,2,1,3,1,2,1,3,1 and so on would have an average access time of 13 seconds for the first page, and apparently could have instant accesses to pages 2

(Continued on Page 26)

Reader Commentary

Marines' DP Operations Not Well Under Control

By John J. Girt Jr.
Special to CW

I found it both distressing and amusing to read the review of the National Security Teams report on Department of Defense (DOD) DP security [CW, Aug. 7]. It was distressing to read the problems that exist within DOD and amusing to discover that the public relations boys over at Marine Corps headquarters have done it again.

The General Accounting Office report prepared earlier this year found the lack of centralization to be a significant problem with the Corp's ADP program. The statement "The Marines have central control over virtually all of their ADP resources . . ." is not only untrue but suggests that someone misrepresented the facts.

The facts are that the Marine Corps ADP program has been limping along with obsolete 10- to 14-year-old IBM 360s, upgraded by equipment released by other agencies because of its age, and maintained by a third-party maintenance contract without sufficient strength to provide adequate support for a system as small as a 360/40.

The merger that took place a year ago to form a single division (C Systems) for the management of command, control, communi-

cations and computer systems has yet to produce a single point for DP procurement. The telecommunications branch buys its own (with the help of the Navy) Univac DCT-9000s for communications. The information system support and management branch is the primary (but not sole) office for the procurement of business DP gear. Command and control equipment is procured by still another office.

The equipment inventory is maintained in a haphazard fashion and has never been close to accurate. Less than 20% of the telecommunications computers and less than 5% of the command control systems have been reported as currently required by the Secretary of the Navy's instructions.

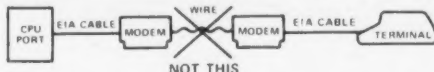
Long-range hardware plans are usually drawn up by ad hoc committees of two or three members of the resources management section. They are usually required to prepare some response to an inquiry, such as that of the National Security Team, and only consistent with the findings of past committees by accident.

Equipment is often procured without the required documentation defined in directives. The Sycor, Inc. equipment currently being used by operational forces

(Continued on Page 28)

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Ribicoff Remarks False Concerning DP, Convicts

By John C. Scott
Special to CW

Some months back I wrote a short article describing the application programmers' vocational training course at the U.S. penitentiary at Leavenworth [CW, April 17] and was pleased by the reception it received from *Computerworld* readers in the DP community.

I realize CW is not a political forum, but as DP has become a political issue, I would like space in your periodical to respond to some absurd allegations made by Sen. Abraham Ribicoff (D-Conn.).

Ribicoff's recent presentation to the 37th International Conference

of the Institute of Internal Auditors was filled with outright lies that were spoken with the senator knowing that they were, but caring

Reader Commentary

only for the political promotion that he could make out of them.

Ribicoff showed no compassion for prisoners, which is his prerogative. However, when he promotes outright lies and innuendoes to destroy a prisoner's chance for a new life, than something must be said.

Ribicoff stated that prisoners in Leavenworth were being trained in computer skills, then being released to commit computer crime. Not only is this false, but the senator has statistical proof showing no inmate programmer has ever left Leavenworth and later been implicated in a computer crime.

Furthermore, the senator is aware that in the case of the inmate defrauding the Internal Revenue System, the computer site was not used and the act did not reflect on the department.

The training course was not only exonerated, but as the graduates were doing so well in the outside community, a sincere effort was made to broaden the program and make it available to more persons.

Service in UK Ties Into TVs

(Continued from Page 25)

and 3 provided the reading time of the first page was 50 seconds.

Just what the future holds for computer access by whole populations via television sets is not clear, but developments are occurring quickly. Hard copy from the screen, overview pictures (characters placed over the picture rather than replacing it), better graphics with double-height lettering and adjacent color bars are being incorporated into some of the current software.

The U.S. and other countries are carefully watching the situation in England. Some time ago, a joint public and commercial television industry inquiry decided this use of TVs to spread computer data was not for the U.S. I have not heard of any second thoughts yet.

This hesitation is probably not because of technical problems, as the British Broadcasting Co. engineers claim to have shown the basic system can be adapted for the 525-line television picture used here. The system puts out the signal in the unused "header" lines preceding each frame in the same way the 50-character tape record preambles precede computer tape records.

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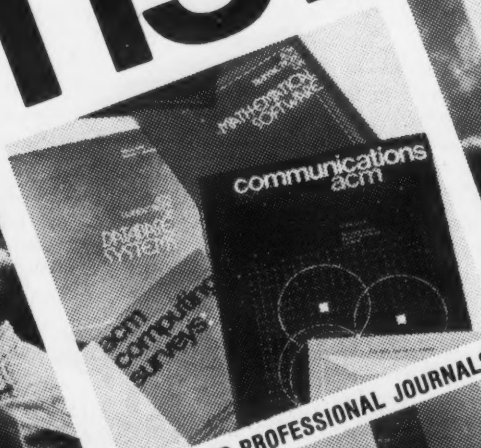
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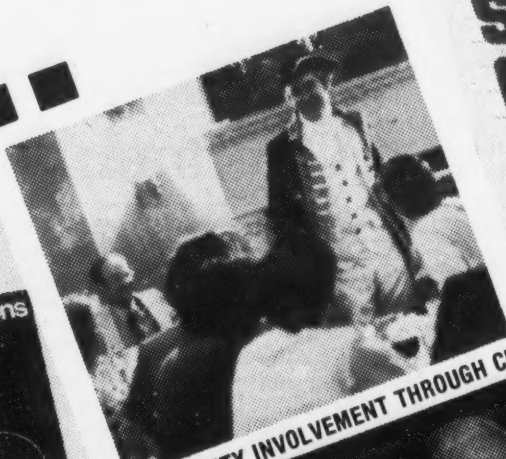
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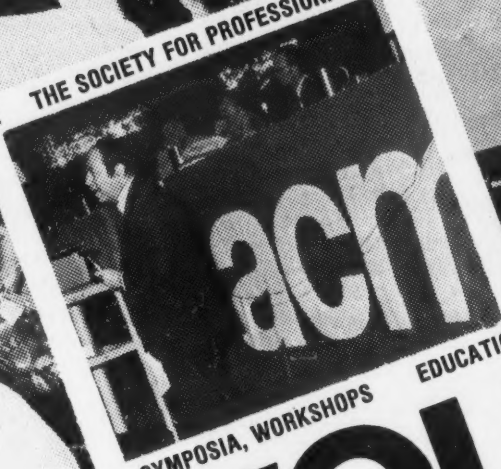
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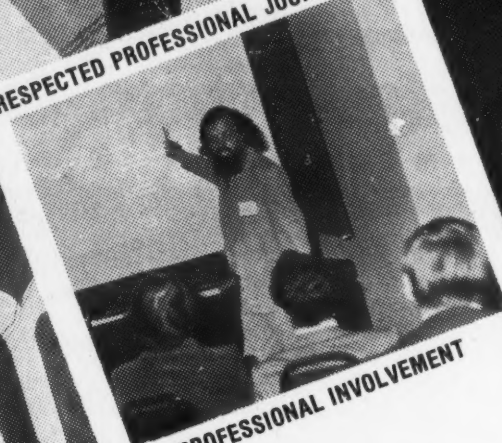
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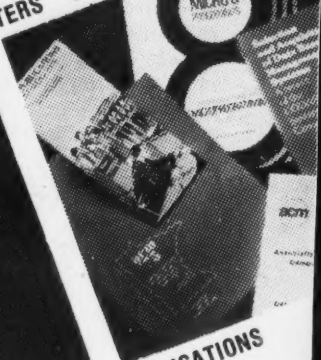
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Antitrust: Curing Hemophilia With Leeches

By David J. Rodman

Special to CW

The editorial "The Right to Decide" [CW, Aug. 28] defended trial by jury as a cornerstone of our judicial system. It denounced the evils of "exclusionary and arbitrary legal rulings" keeping us all from enjoying the benefits of the antitrust laws.

Yet the history of antitrust is the history of the most arbitrary and contradictory legal rulings in our 200 years of waning capitalism. The Sherman and Clayton Acts were ostensibly intended to prevent "restraint of trade" and "unfair" business practices. Over the years, it has become accepted that it is unfair for one company to have better

ideas, better marketing methods, more money, a bigger share of the market, and so forth, as compared

Reader Commentary

with other companies who wish to compete. Yet little consideration is given to the rights of the original producers who create markets in the first place.

Even so, the metastasis of antitrust has not yet proceeded so far as to outlaw all forms of competitive advantage, as evidenced by the fact that IBM has managed to convince

six federal judges to date that its business practices are not anticompetitive, just successful. How much more must IBM be forced to spend in defense of its excellence? And how many millions of tax dollars will the Justice Department misappropriate in a decades-long struggle to break up the founder and leader of our industry?

In Whose Interest?

Would anybody's interest be served by destroying IBM or making it into a lot of little NBMs or LBMs? If it's so great to compete against small companies, why don't we see more companies selling Intel-compatible mainframes or Memorex-compatible peripheral

controllers?

In fact, it's wonderful to have a giant like IBM in an industry. For one thing, if you can find a way of putting its name on your product, you sell more product. For another, such giants create markets just by having so wide a wake, and entrepreneurs who are sufficiently wide awake are selling those markets, not trying to reduce their size.

It is past time for professional DPs to recognize and defend the principles which have, to a large extent, accounted for our extraordinary success as an industry. We have been relatively free from regulation, coercion, licensing, special taxation and all the predatory practices our liberal government has used to whittle away other industrial growths and successes in past decades.

Calling for stricter enforcement of antitrust to cure market imbalances is like calling for leeches to cure hemophilia. I, for one, would like to see a more rational theme in the editorial pages of the industry's most popular vehicle of ideas.

Rodman is president of DJR Associates in McLean, Va.

Marines' DP Not Controlled

(Continued from Page 25)

aboard ship is leased. This places the Marine Corps in a possible liable position in the event of emergency.

The Sycor systems have no parts in the federal supply system. This requires significant communications to obtain spare/replacement parts. Such parts are not on federal supply schedules, which then require a sole-source procurement to obtain. It has taken as long as 60 days and more to repair such systems because of spare parts problems.

Personnel Problems

Personnel are not identified as having been trained in Sycor maintenance. This necessitates the training of a new individual every time one is transferred. There is no pipeline identified to provide repairmen. The training required is not centrally managed but accomplished by each activity as requirements are identified.

After having served 10 years in the Marine Corps, most of which was in ADP with the last 2-1/2 years at Corps headquarters, I found the hypocrisy more than I was willing to take part in. I find the fighting force of 20 years ago has fattened into a technological beast requiring a cadre of technicians to support.

I salute the brave souls who fight the day-to-day battle of mismanagement to get some sort of job done.

I am not bitter about my Marine Corps service. I am fearful that such mismanagement is not restricted to DOD. It is time for those responsible for executive review to perform their tasks with diligence.

Girt, a first lieutenant with the Marine Corps, resigned effective Aug. 13.

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Specialized Gear Consumes Time Users Badly Need Simplified, Uniform CPUs

By Jim Ryan
Special to CW

What this country needs is a good five cent cigar and a good general-purpose computer. Unfortunately, the five cent cigar is no longer possible because of economic and health reasons. The general-purpose computer, however, seems about ready to appear on the scene in reaction to the proliferation of superspecialized, superfast and superefficient computers presently available.

During the past few years, we have seen experts in hardware, software, peripherals, controllers and CPUs develop superfast, superefficient devices which unfortunately require a legion of specially trained people to operate and maintain.

The reason for all of these special devices and methods can be traced back to a concept which continually stressed the need for the greatest amount of processing in the shortest possible time at the lowest cost.

As a result, we now have serial and parallel processing with all kinds of bus bars plus specialized software to shorten processing time from memory to CPU to input and output devices. But the specialized software and hardware requires very specialized equipment to test, diagnose and isolate troubles. When replacement parts are required, there is no such thing as a universal replacement.

By accident or design, the user gets locked into a software and hardware service contract and is at the mercy of the service organization. If the service organization decides it is no longer feasible to maintain a specific type of equipment or software, the user may be forced to replace his present equipment.

General-Purpose Computer

When users try to put things into perspective, they suddenly find there are really only a few general uses for computers, and a general-purpose computer would satisfy all of them.

Uses can be summarized into the following categories:

- The solution of mathematical problems.
- Bookkeeping problems in which all accounting and inventory control operations are computerized.
- Manufacturing and measuring devices which control machine operations and/or the status of various types of material flow. Included are all alarm and security devices.
- Communications processing, which includes all kinds of devices used to forward and transfer information from one location to another.
- Graphic display, the most recent application.

From the very beginning, computer designers emphasized the application. Thus, the computer was developed with specific applications in mind. This has resulted in the present variety of hardware and software.

Thousands of hours are devoted to fine-tuning special applications which require more thousands of hours of special training to operate, test and maintain.

It appears the time has arrived to make a wide-ranging study with the specific objective of developing a general-purpose computer which will meet the objectives stated above for a large percentage of user applications.

Uniformity Needed

If these objectives are met, the user will gain a tremendous advantage by eliminating the need to make exhaustive studies of various

types of systems to find the best one. These studies often lead to a selection of the wrong system in spite of detailed studies because of

Reader Commentary

contradictory options, marketing and sales brochures.

From the user's point of view, it would be much better if all computers were uniform and could be purchased or leased by size only, with sizes restricted to micro, small,

medium and large. The proposed general-purpose computer would have the same features in all sizes, and the only reason for size selection would be to ensure the proper relationship between storage, processing, information exchange and I/O devices.

The only concession to special applications would be designed into the computer using the modular concept. For example, if the user had an application which required an unusually large amount of memory storage but all of the other features were in proportion, it would be possible to add modular units to

(Continued on Page 31)

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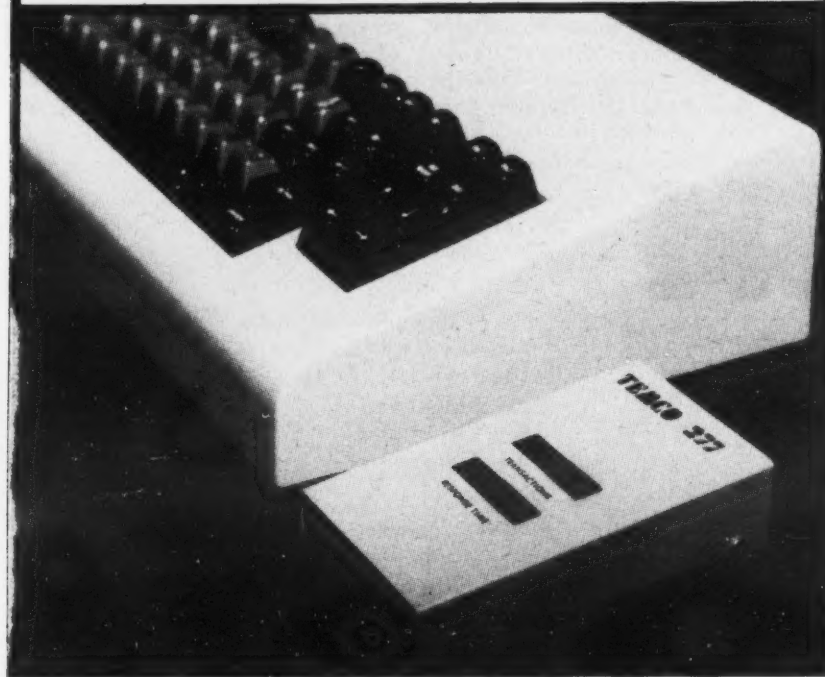
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Responsibility vs. Authority Lying to Management:

By Miles Benson
Special to CW

Clint Ransom was one of your all-time-top software maintenance men.

Well, maybe that's putting it all wrong. Clint didn't wear white coveralls or get grease under his fingernails from fixing things. But what he could do with a well-worn program listing, a coding pad and a fast-moving pencil would fairly boggle the mind.

Clint could leap tall data management hurdles in a single bound. He could code his way out of a logical swamp with schedule alligators snapping on all sides. His configurations were so well managed you hardly knew he had any.

And if cleanliness is next to godliness, Clint's solutions were so crisp and clear as to be hallowed.

In short, Clint Ransom was a programmer's programmer. But with a difference. Because where other programmers hate to do maintenance, hate to do debugging, hate to do documentation, Clint ate it all up. Maintenance work was his bread and butter and, like a hot dog, he devoured it with relish.

One Problem

There was, however, one problem with Clint Ransom: He knew his job too well. No, I don't mean he knew it so well that no one could tell him when he'd done something wrong. He wasn't caught in the ego-full programmer trap, at least not that one.

The problem was that no one could really manage him. He knew his job so well that he functioned best in the total absence of direction from above.

If a manager said, "Here, take over this program and be responsible for correcting all its flaws and implementing all its changes," Clint could go on working with no further direction for several years.

For some managers, those who really understand software maintenance and highly skilled technical people, that presents no problem at all. The manager could gesture vaguely, Clint would take the gesture as sufficient direction and both Clint and the manager would then be free to go off and do what they did best — Clint to maintain the gestured at software, and the manager to — er — do whatever it is managers do.

Among the Thorns

But this story is about the time Clint Ransom fell among thorns. Symbolically speaking.

There are some managers who just have to do things their way. The problem arose when Clint met one of those.

Now, if Farley Snodgrass doesn't know his eraser from his pointy end, he needs to be managed closely. If Bullshot Thunder works up a storm but uses bad judgment at the top of his lungs, he needs to be managed closely. And if Donald

Doolittle is a Fulbright Scholar whose favorite workstation is the water cooler, he needs to be managed closely.

But when you have a self-starting, fuel-injected, automatic transmissioned worker like Clint, you do not manage him closely.

Frank Faretheewell couldn't see it that way. When Frank moved in to take over the Balderdash Iron and Steel software maintenance organization, he found both Farley Snodgrass and Clint Ransom in his inherited empire's inventory.

Mumbling something about the manner in which both Farley and Clint pulled on their pants, Frank set about to make sure they both responded the same way to the same kind of harness.

It took a little while for the full impact of the change to hit Clint. After all, he had been maintaining the Balderdash payroll program, its chemical properties analysis program and its real-time input control program for five years without direction.

When Frank started telling him what to do, he thought at first it was a joke. The programs hummed like elegant, finely tuned watches. They were responsive to change, as reliable as the sunrise and as easy to understand as a single-path maze. Why would anyone be telling him what to do?

But Frank was determined to manage. Whether he needed to or not.

Digression Time

It's time to digress for a moment. There is more to the Clint Ransom-Frank Faretheewell problem than a simple clashing of personalities. What we have here is a prototype of the whole software power structure dilemma.

Look at the problem generically for a moment. Frank had the authority and the power. Clint had the responsibility and the product control. The question is, what do they each do with their respective attributes?

Tradition seems to say that authority subsumes responsibility and power overwhelms product control. But there are other options.

Product control is in fact the ultimate power. And as long as responsibility resides with product control, the best ends from the corporate point of view can be achieved by ignoring or circumventing authority and power.

Well, that's all pretty heavy stuff. Important, but heavy. And at the moment when the seriousness of his dilemma hit Clint Ransom, he really didn't have time to sort out all the philosophies at stake. He just knew that life had suddenly become intolerable. And that he had to act.

The Battle Issue

The specific issue around which the clash grew was simple enough. Frank asked Clint for an activity report. No sweat, right? We all do them.

But there was a difference here. (Continued on Page 31)

A Legitimate Solution?

(Continued from Page 30)

Frank wanted all of Clint's activities tied to either a change request or a problem report.

Even that, at first glance, seemed innocent enough. After all, whatever Clint is doing should be traceable to an outside request. Right?

Wrong. Let me try to explain why.

When Clint first took over the chemical properties analysis program, its logic was convoluted and unreadable. To respond to a change request required a six-week learning curve followed by a two-month trial-and-error fix period. The program was ready for the obsolescence heap on grounds of inflexibility.

So Clint dived in — in the total absence of a specific change request or problem report — and began to clean up the program. And the more he cleaned, the better it got. Change responsiveness dropped to two weeks and sometimes less.

In the course of doing that cleanup, Clint began to understand what maintenance of software is all about: Not just force-fitting fixes and changes into an unwilling framework, but lavishing large doses of tender loving care on an awkward framework so that when the time comes to make a change or fix, the framework is in shape to make the job easy. Not just solving specific problems, but writing general solutions anticipating future requirements.

The program was literally rehabilitated off the scrap heap. Problem correction was isolated to relevant modules instead of scattered all over the program.

Not always, of course. Some problems aren't worthy of that kind of ongoing TLC. But chemical properties analysis was. And so were the other programs for which Clint had responsibility.

Now back to the Frank Faretheewell take-charge approach to management. As Clint and Frank began to circle warily around their dilemma, throwing cautious verbal punches at each other, it at first appeared a compromise might be workable.

The obvious one, of course, which Clint suggested, would have him continue to function as he had in the past, reporting his activities in three categories — changes, fixes and cleanup.

Frank, however, would have none of that. There were, he blustered, only two legitimate categories for maintenance activities — and cleanup wasn't one of them. Cleanup was wasted time.

Things escalated rapidly toward an impasse after that. Frank held firm. And it was up to Clint, in response to Frank's authority and power, to bend.

Stating the Obvious

I think the dilemma is clear at this point. But, to be sure, let me state the obvious. Clint has given management his best technical judgment. Management has heard and rejected it.

Clint has only one choice, then — to give in to management and quit cleaning up his programs. And, in the doing, to lessen his sense of responsibility.

Or does he?

Clint could, he saw, continue to do his work as he had in the past and retain his sense of responsibility, if only he would lie to his management about the nature of his activities. Some of his cleanup could be reported as changes, others as fixes.

Down at the nuts-and-bolts level of program maintenance, Frank Faretheewell would never know the difference. Only Clint Ransom and his conscience would know what was really happening.

Well, this situation, mired down at this point in balancing deception against irresponsibility, managed to come to a happy ending.

The decibel level from the Frank-Clint verbal fireworks had been loud enough to be heard by Frank's boss. And in this case, the boss was knowledgeable enough to know how to use technical talent, when to override it — and when not to override it.

To make a painful and long story shorter, Frank was eased out of his position of authority and power into another, where his desire to mangle his way would do less potential corporate damage.

But Clint was left with the unsettling knowledge that, if necessary, he would have lied to his management to save his sense of responsibility. And that, at the bottom of the hierarchy where the technology resides, he could have gotten away with it.

Simplified CPUs Needed

(Continued from Page 29)

obtain additional storage capacity.

The ultimate objective would be to make the computer system transparent to the user. Every user should feel comfortable and knowledgeable about his system.

All responsible users must have ultimate control of their operations and most of them should have backup systems in case of major failures such as power outages. With some standardization, users should be able to put themselves back into business without the aid of a service specialist in a higher

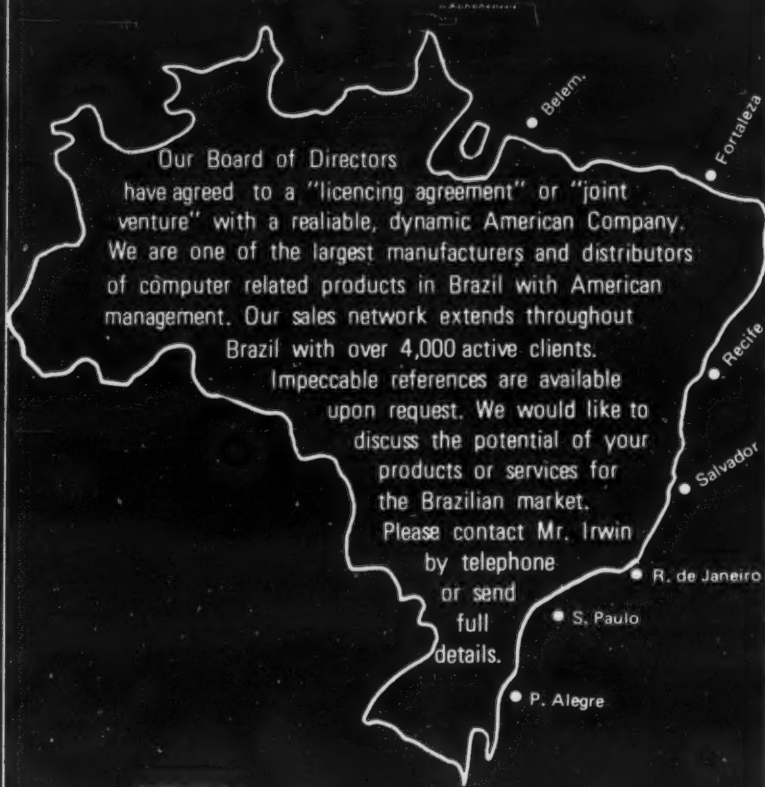
percentage of outages.

Although the obvious place to achieve this standard is in computer organizations, the probability is that it will only come about when technology has advanced so far that one clear method is obvious in each category.

In the meantime, the user must struggle along doing everything possible to absorb all of the changes and hopefully integrate them into his operation with reasonable success.

Ryan is a retired DP user.

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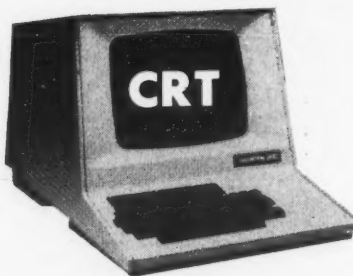
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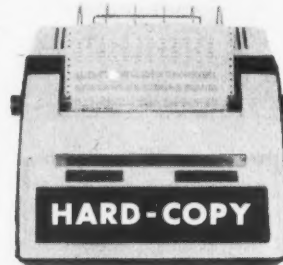
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CFSMTS is a DOS/VS system enhancement which provides multiple Logical Transient Areas; one per partition and one for the Attention Routine. CFSMTS is release independent and supports systems with up to 15 partitions. CFSMTS will run on all DOS/VS systems including the S/370 115 through the 370/158, 3031, and S/360 or compatible machines.

Features:

Each problem program can concurrently execute code which requires use of the LTA (Logical Transient Area).

CFSMTS provides a dynamic classification facility to control the concurrent usage of \$B transients which are dependent on a single resource.

The user may classify his own transients or any other transients at any time by executing the CFSMTS program and submitting appropriate parameters.

CFSMTS provides a statistical printout, on demand, showing any overlap that has been gained. These figures show an occurrence count and the elapsed time that 'n' transient areas were active concurrently. A summary of elapsed savings is also calculated both in terms of time saved and its percentage.

Supervisor Prerequisites:

CFSMTS requires an addition to the standard DOS/VS supervisor; however, this modification contains no executable code. This addition simply reserves space for the additional transient areas.

Hardware Requirements:

The CFSMTS program to activate the Multiple Transient Support requires either a virtual or a real partition of 32K in which to run. This program is executed only to activate Multiple Transient Support and to print the accumulated statistics.

CFSMTS is available from CFS, Inc. as a licensed program product and may be leased monthly, yearly or on a one-time lease arrangement for \$130.00, \$1,425.00 and \$4,275.00 respectively. All three lease plans include maintenance and support for as long as CFSMTS is installed.

Send requests for CFSMTS to CFS. License agreements along with detailed information will be sent by return mail. Inquiries may be directed to:



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\$5,000 for Best Work For Good Papers, SMIS Offers Reward

By Don Leavitt
CW Staff

CINCINNATI — A call for papers with a difference — a \$5,000 difference for the first prize paper — has been issued by the Society for Management Information Systems (SMIS).

The \$5,000 for the best paper and additional awards for runners-up have been provided by several organizations which are institutional members of SMIS. In addition to the monetary awards, the papers will be presented at the society's annual meeting next September and may be published in its journal, according to spokesman James H. Scott, design manager at Proctor & Gamble Co.

The society has offered the prizes to encourage pride in those who have created good systems and to spark meaty discussions about real systems, not just theories, according to last year's SMIS president, Herbert Halbrecht, who started the idea of the cash awards.

Abstracts Sought

The selection committee, headed by Scott, is initially seeking abstracts of up to 500 words describing a management information system (MIS), an approach to developing informa-

tion systems or techniques for improving MIS activity or management.

Whatever the topic, the work described must have been at least implemented, evaluated and found to have had significant beneficial impact on the user organization, Scott said.

The abstract should include a brief statement of the work, the extent of its implementation and an assessment of its impact on the organization. The abstract should be accompanied by a letter from a senior management

user indicating why the work is worthy of special mention or a prize and identifying the benefits the organization has derived from the work.

The impact statements should be in terms of benefits appropriate to the general purpose of the user organization, Scott said, citing contribution to profit, improvement of service and reduction of cost as the type of gains that would be deemed acceptable.

Since the society's emphasis is on management, the abstract —

and the complete paper, if the abstract is accepted — should relate to the management of the information function within a complex organization, rather than to the specific computer-based technology, Scott stressed.

The competition is open to all SMIS members or employees of institutional members (or those applying for membership). Five copies of each abstract should be submitted by Dec. 15 to Scott at the Management Systems Division, Proctor and Gamble, P.O. Box 599, Cincinnati, Ohio 45201.

'DDP/1' Puts Series/1 in Office

BOULDER, Colo. — IBM's Series/1 minicomputer can be used in support of general office automation and not merely data processing if the using installation utilizes the Distributed Data Processing (DDP/1) package from Systems Design and Development Corp. (SDD), a company source claimed recently.

DDP/1 enables the user untrained in DP to create CRT screen formats comparable to the business forms his company has traditionally used, then to define the type of data that should be entered on each of the electronic forms or documents thus created,

the spokesman explained.

Since the software supports the user's business in terms he can understand, including a sort facility so data collected from a number of "forms" can be sequenced, it allows the Series/1 to be used in a virtually unlimited range of applications, SDD said.

DDP/1 also supports communications facilities. Terminals permit simultaneous access to forms and documents by multiple users; the system can transmit and receive documents between Series/1s as well as mainframes, the spokesman added.

Customizing support plus user

training and installation guidance are covered in an initial fee, after which the software is available for \$325/mo, SDD said from 2355 Canyon Road, Boulder, Colo. 80302.

Slick, CMS Tied

ATLANTA — With a specialized interface capability, the Slick library maintenance system from NCI, Inc. can now be used under IBM's Virtual Machine Facility Conversational Monitor System (VM/CMS) on IBM 370 mainframes.

Slick/CMS allows the user to specify the member name and its status in the Slick library, extract, copy and transfer contents of that member into a CMS file for text/program editing, a spokesman explained.

Slick costs \$2,950 (DOS) or \$3,950 (OS); the CMS interface costs an additional \$1,000, NCI said from 6075 Roswell Road, Atlanta, Ga. 30328.

Network Adds Financial Data Base

FAIRFIELD, N.J. — The Telerate Historical Data Base, now accessible on the Rapidata remote computing service network, is said to contain more than 8,000 daily and weekly time series on domestic credit markets and supply factors that affect the course of interest rates.

The primary purpose of the data base is to help institutional investors, credit market analysts, bond traders and salespeople in performing a broad spectrum of analysis and report functions, a

Rapidata spokeswoman said.

Data is provided on nearly all money market instruments for each maturity, by issuer, and on a nationwide market consensus basis, with bid and offer quoted and bond equivalent rates, she continued.

The data base includes each outstanding U.S. Treasury bill, note and bond as well as major federal agency securities. For each security in the government bond market, data is provided for bid, offer and center of market

prices and yields.

Using data from Telerate Systems, Inc. as their information source and Rapidata's data base technology as their driving force, the data base analysis and report functions include interest rate monitoring and forecasting, analysis of investment and borrowing alternatives, portfolio performance reports and portfolio accounting.

Rapidata's network is headquartered at 20 New Dutch Lane, Fairfield, N.J. 07006.

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HP Adds 'View/3000'

PALO ALTO, Calif. — The View/3000 package from Hewlett-Packard Co. was designed to enable even DP novices to create and use data entry forms on a CRT attached to an HP 3000 system.

In particular, the software offers a self-contained data entry facility that performs validity checks on incoming data and allows modification of stored data without going through traditional programming. It also provides a simple interface for interactive transaction processing applications, a spokesman noted.

The forms design (CRT screen formatting) facility provides the user with an interactive "fill-in-the-blanks" approach to that problem.

The user simply has to define the form and the field characteristics, along with the validity criteria, and the software creates the program to check incoming data, he said.

The data reformatting facility that is also part of View/3000 simplifies the use of the data by existing application programs once the data has been validated and brought into the system. Meanwhile, a programmatic interface provides control of terminals, forms and files from the user's programs written in Basic, Cobol, Fortran, RPG or HP's own Systems Programming Language.

View/3000 carries an initial fee of \$1,000 and a monthly fee of \$75, HP noted from 1507 Page Mill Road, Palo Alto, Calif. 94304.

Data 100 Keybatch Units Get Line-to-Disk Spooling

MINNETONKA, Minn. — Version 4 of Data 100 Corp.'s software for its models 74 and 78 Keybatch systems supports the attachment of the company's 62 line/min printer to the remote keystation. It also has a line-to-disk spooling capability and an auto-answer feature.

Other Version 4 features include enhanced verify and batch balancing options as well as formatting and operator statistics improvements, a spokesman said.

The enhanced remote keystation capability is intended for clustered key-to-disk users with additional data entry requirements at remote locations who want to share the resources of

their Keybatch facilities over communications lines.

The addition of the printer at the remote sites makes hard-copy output available where it was not practical previously, the spokesman noted.

The line-to-disk spooling capabilities can be used concurrently with data entry operations. In addition, through use of the auto-answer feature, the Keybatch system can answer incoming calls without operator intervention and store the data on disk for subsequent printing.

The vendor claimed that Keybatch systems running under Version 4 software in test situations attained throughput improvements of 20% over previous implementations.

The cost of the software is bundled into the cost of the Keybatch hardware, he added from 6110 Blue Circle Drive, Minneapolis, Minn. 55435.

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Credit Unions Backed on Net

GREENWICH, Conn. — Focus 300 service, an on-line share and loan accounting facility for smaller credit unions, has recently been implemented on the remote computing network of the Service Bureau Co. (SBC).

Said to provide many of the reporting features available with SBC's other on-line credit union services, Focus 300 was developed primarily for unions with 1,000 to 3,000 members, a spokesman said.

The service enables credit unions to have immediate access to member accounts for such activities as preparing checks for loan disbursements and share withdrawals, obtaining current share and loan balances and updating member accounts, he explained.

Services and reports available from Focus 300 (and not available from most batch systems, SBC said), include a daily on-line cash management report, terminal-prepared checks for loans and withdrawals, variable dividends keyed to each member's share account and microfiche service for record retention as well as account inquiry support.

Member statements, delinquency reports and notices, a dividend and interest refund register, trial balance, posted transaction register, new and closed accounts, complete 1099 reporting and a variety of management reports are also provided.

More than 40 individual reports are available for the credit union's selection, the spokesman added from network headquarters at 500 W. Putnam Ave., Greenwich, Conn. 06830.

Book Outlines Design

MANCHESTER, England — Issued originally as a report to members of the National Computing Centre Ltd. (NCC), *Program Design Methods* by G.B. Bleazard concentrates on IBM's Improved Programmer Techniques (IPT) and the Jackson method.

The 104-page book is available for 3 pounds, 50 pence plus postage — or approximately \$7.50 — from J.M. Dent & Sons Ltd., Dunhams Lane, Letchworth, Herts, England.

Runs on ARC Systems

Support for Longer Names Seen Basicplus Highlight

SAN ANTONIO, Texas — Support for larger field names and more efficient use of memory are said to be two of the advantages available through the Basicplus language recently introduced by Datapoint Corp.

In addition to being upward-compatible with previous Datapoint versions of Basic, Basicplus includes many of the features of the proposed American National Standard for the language, according to a spokesman.

Numeric operations and functions, transcendental functions, logical operators and matrix operators with determinants and transformations are among the features added to this implementation, he said.

To use these capabilities, however, Basicplus must execute on a stand-alone processor at least as large as the 48K Datapoint 5500 or in an Attached Resource Computer (ARC)-dependent processor such as a Datapoint 3800 with 60K bytes of memory.

This version of Basic will accept variable names up to 78 characters long and allow multiple statements per line of code. In addition, it provides for chaining and keyboard-controlled execution of programs, automatic configuration of printers, release of any unused printer support memory and disk I/O in standard Datapoint file format.

CICS Used as Basis

For DOS/VS Displays

GREEN BAY, Wis. — The display functions IBM has offered in batch programs "for years" are now available to the DOS/VS CICS user with a program from Dynamic Products, according to a spokesman for the company.

He said, for example, that the display functions of IBM's Dserv, Cserv, Rserv, Sserv, Lserv, Pserv and LVtoc programs are all included in one CICS application program Dynamic is offering.

With the utility, users can display system and library directories, library data, standard label information (including partition standard and partition temporary labels) and the volume table of contents (Vtoc) of any disk pack, the spokesman said.

The Vtoc display function has two unique functions, he claimed. It does not require the drive on which the disk pack is mounted to be assigned at the time of the request.

Second, it allows the user to display all unused areas on a disk pack. A procedure is also provided to clear a Vtoc entry and make it appear as unused to the Vtoc display, he said.

The directory display function enables the requestor to specify either a complete search argument, in which case only the item matching the argument will be displayed, or a more generic search argument, in which case all entries that start with the same characters as the search argument will be shown.

The display package is available for \$65/mo but the source code can be leased for a one-time fee of \$750.

Dynamic Products can be reached through P.O. Box 3445, Green Bay, Wis. 54304.

for compatibility of files among languages, he continued.

Record access may be random, sequential or indexed sequential. Numbers and strings are kept in the same format, as edited characters; hence, Basicplus output can be written as strings and read back as numbers, or vice versa.

Basicplus is a licensed produce available for \$500 or \$20/mo. In either case, there is an additional \$10/mo maintenance fee, the spokesman noted from 9725 Datapoint Drive, San Antonio, Texas 78284.

Ecoma-6 Set for October

LONDON — The semiannual conference of the European Computer Measurement Association, Ecoma-6, will take place here at the London Tara Hotel Oct. 17-19 and feature two seminars on computer performance modeling by Dr. Jeffrey Buzen of U.S.-based BGS Systems, Inc.

The seminars will be management-oriented and deal with the role of computer performance modeling within the DP organization and the technical requirements for successful computer performance modeling, according to a spokesman.

Other professional seminars by long-time users of computer performance measurement tools will make up another segment of the

conference.

Attendees will also be able to sit on a demonstration of Univac's Benchmark Monitor Display. Built into Univac 1100 series CPUs, the hardware monitor should be of interest to anyone interested in state-of-the-art monitoring, the spokesman said.

Various working and liaison committees within Ecoma will continue their programs of discussion and information exchange at the conference and anyone interested is welcome at these sessions.

More information about the conference or about Ecoma itself is available from the association's president, Scott N. Yasler, Scheuchzerstrasse 5, CH-8006, Zurich, Switzerland.



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Version of 'SAS' Now on GE Net Backs Charting of User's Results

RALEIGH, N.C. — An enhanced version of the Statistical Analysis System (SAS) from SAS Institute, Inc. is now available on the General Electric Co. Mark III remote computing network in both interactive mode under IBM's TSO or background mode under an IBM VS environment.

SAS has been described as a total system combining a wide range of statistical procedures, data management tools and report writing features. The system can read data from cards, disk or tape in any format, including binary and packed decimal; sorting, merging, concatenating and subsetting data is easily done, according to a spokeswoman.

'Update' Eases Use of 'Reality'

BELLVUE, Wash. — The Update package from Cosmos, Inc. enables users of the Microdata Corp. Reality data base management system to generate an interactive CRT "process" in minutes from a simple English-like sentence, according to a spokesman.

The generated process allows the user to maintain or inquire upon the contents of any item in the data base, working with the attributes specified in the Update sentence.

With the utility, items may be added, copied, changed or deleted, saving the hours of programming traditionally required when Microdata's Data/Basic is used, the spokesman claimed.

Uses Existing Files

Update can operate on existing files without costly conversions, he added.

Each Update process edits data for validity as it is entered. These edits include pattern matches, range checks and file verification — an approach that allows any desired attribute to be returned to the CRT screen for checking.

Update operates on releases 2.4 through 3.0 of the Reality operating system. The software costs \$895 plus \$35/mo for maintenance and updates after the first 90 days.

Cosmos is at Suite 19, 13400 Northup Way, Bellvue, Wash. 98005.

SAS 76.6 is a relatively minor release of the system, she said, but it includes a charting facility that can produce horizontal or vertical bar charts and pie charts.

Star charts — a variation of pie charts with "good" and "bad" factors positioned on radii of a circle in such a way that the ideal pattern is a star — are also available through

SAS 76.6, she said.

The software has also been packaged for in-house use on IBM 360 and 370 equipment as well as being available on the GE net.

More information about the software whether installed on the network or packaged is available from SAS Institute, P.O. Box 10066, Raleigh, N.C. 27605.

Distributors Go On-Line

DAYTON, Ohio — An Interactive Distribution System for Electrical Distributors and Wholesalers (IDS/EDW) has been released by NCR Corp. for use on its I-8150 mainframe.

Intended for small firms, the package is said to include inventory control, order processing and sales analysis. Accounts receivable, accounts payable, payroll and general ledger applications are also available.

The interactive approach reduces the change of errors and the time needed to get the files posted with current data, according to a spokesman.

Requiring at least a 64K-byte I-8150 with a 4.9M-byte disk and a 50 line/min printer, IDS/EDW costs \$3,495 or \$105/mo and is available immediately.

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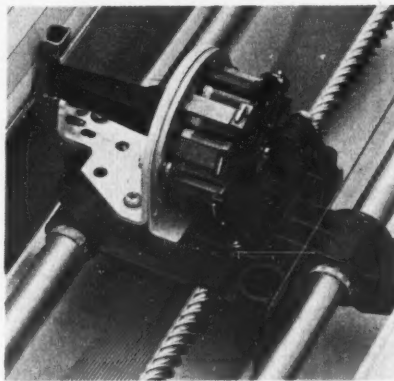
Bi-directional printing increases throughput. Both printers zip along at 180 cps in both directions, depending on your line layout. The microprocessor chooses the quickest path, and increases the speed even more by suppressing leading and trailing blanks.

High-speed slew for columnar data. When the microprocessor senses more than ten blanks in a row, it slews the print head at 45 inches per second to the next print position.

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High-quality print, with six copy resolution. A 7 x 9 dot matrix (versus the usual 7 x 7) gives you clear, crisp printouts, right down to the sixth copy and meets the 128-character USASCII standard. And the extra two dot rows allow true underlining and descenders without character blurring.

Programmably interchangeable character sets. The HP 2631 can be made to print alternate character sets without reconfiguring the printer.



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Dennis Fogleman and Ginger Neal check output at Public Finance.

Finance Firm Finds Good Payoff In Utilitarian Software Package

ST. LOUIS — Public Finance, a locally based division of American Investment Co., has more than 466 consumer finance branch offices in 29 states. This huge network is supported by an IBM 370/158 running under OS/VS1 and a DP staff of more than 60 people, 25 of whom are in operations.

The shop is equipped with

17 CRT terminals as well as a monitor for insurance claims, a security system named Sentry and a conversational remote job entry system called Isis — all developed in-house — plus a package called DYL-260 acquired from Dylakor Software Systems, Inc.

Dennis Fogleman, software manager, said he likes the Dylakor package because it does

many tasks required by Public Finance's software group, applications programmers, auditing people, marketing department and technical services staff. For example, the internal auditors use DYL-260 to categorize and stratify such data as consumer loans and delinquency rates.

The marketing department keeps track of a number of variables (such as lease terms, furniture and key personnel) at each of the almost 500 offices.

DYL-260's selection and extensive report writing capability are helpful for quickly producing special "one-time" reports, Fogleman said. The users can select, perform arithmetic/logic operations and print any variables and records of interest.

SMF Analysis

Fogleman's group uses it for analysis of SMF data. This is the largest single application. Recently, his group wrote a DYL-260 system to analyze terminal usage.

Other analysis involves hardware justification: Should the user add more core? Can it go to a smaller 370?

As Fogleman put it, "Without the package, answering these types of questions would have been much more difficult and time-consuming."

The indexing facility is also extremely important to the DP staff at Public Finance; they build tables and retrieve data from tables. This facility is great, Fogleman said, for handling variable-length records with a variable number of fields and variable-length fields, such as the Consolidated Function Ordinary (CFO) master files.

"DYL-260's linkage to other languages is enormously valuable to us," and ease of getting reports also ranks high," the manager added.

As a programmer's productivity tool, the DP department uses DYL-260 to test files and develop prototype and interim reports. Public Finance has become known as an installation that gets many different jobs done with the facilities on hand.

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Data Base: Practical Issues — Part I

Users Force Old File Methods on New Systems

By Robert E. Roach

Special to CW

Data base systems are loaded with power which is only beginning to be exploited. Steve Robinson was right when he said in one of his "Data Base Corners" last year that users impose second-generation sequential file processing tech-

niques on third-generation hardware and software.

Even when intrepid data base administrators and application programmers make use of novel concepts such as hierarchical, network, inverted or relational file structures, all too often the result is a sequential process using ran-

dom access files. Or it is a ridiculous structure, such as a many-level hierarchical file which, like a house of cards, will readily collapse.

To be effective, data base and application design should consider the following objectives:

- Data structures which closely model the actual business relationship.
- Design simplicity
- The development of independent "utility files" which may be shared by many applications.
- The development of networks of application reporting

This is the first installment in a three-part series on practical issues in data base design written by Robert E. Roach, formerly a senior systems analyst for Citibank and now a senior consultant for Mathematica Products Group, Inc., the vendor of Ramis II.

files and utility files.

- The use of English-like, nonprocedural languages together with Cobol (or other lower level) procedural languages.

This series of articles will address these points in turn. The examples are based on Ramis II, a system with both data, base and nonprocedural language facilities.

Profitability is at the heart of all profit-making businesses, and accounting for the use of funds is certainly necessary as well in both private and public nonprofit organizations. So, for an example, consider an application to track the financial results at the profit center level of a corporation.

Corporate executives commonly view their organization as a hierarchy. At the top is the entire corporation and its overall profit. Below that are the corporate divisions, the departments and so on down to the profit center level.

In fact, we could go further down in detail. We could break out the detail of products or customers within each profit center.

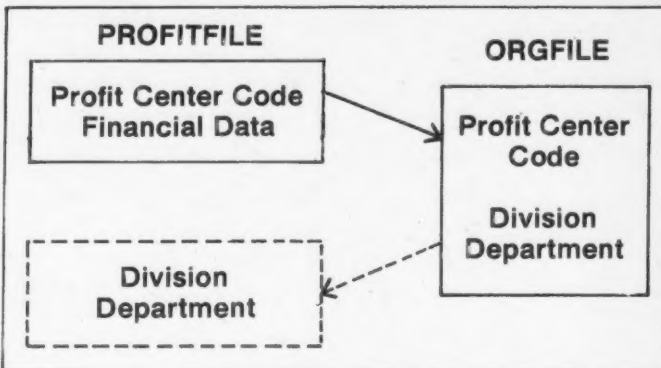
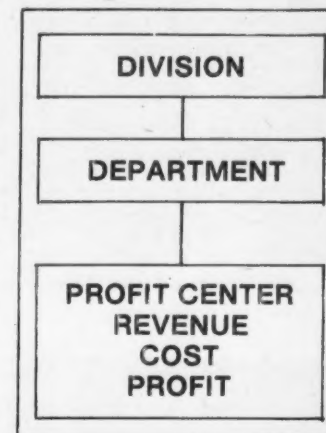
To complete the picture, assume that we are tracking three items; revenues, costs and profits.

In Figure 1, this file structure is shown as a hierarchy. Each of the levels may have multiple occurrences within the level above it.

While this structure models the executive's hierarchical view of management, it has a serious flaw. What happens if a division is split in two or several departments are merged? The file must be restructured with the new organization chart, and then finan-

(Continued on Page 40)

Figure 1 (right) shows financial data organized like a business hierarchy. In Figure 2 (below), the financial data is organized by profit centers, each of which is part of other organizational units.



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'Create' System Supports DG-Based Data Base Tasks

HORSHAM, Pa. — The Create data base management system (DBMS) from Complete Computer Systems is said to let a Data General Corp. minicomputer user establish and maintain data bases easily while optimizing storage requirements and simplifying report generation.

The software is intended to help the professional DPer and the novice, a spokesman said. It is available by itself, with any of Complete's minicomputer systems or with various application programs already packaged to handle many of the conventional DP tasks.

Create supports the user, through prompting messages, as the data base is being built. As the user inputs the name and characteristics of each field, Create determines and prepares to exercise edit criteria such as maximum and minimum values, upper and lower case print format and CRT cursor positions.

The system also implants user-chosen keys, generates audit trails, optimizes the file structure, standardizes data into a format accessible to other programs and prepares system documentation, the spokesman said.

'Respond' Backs Use of Century

CLEAKHEATON, England — Described as a general-purpose utility routine which is, in effect, a miniature load-and-go programming language, the Respond package now available from Computer Facilities Software Ltd. (CFSL) will run on any processor using NCR Corp. Century object code.

Respond was developed by Commonwealth Systems of Lancaster, Pa., and is being marketed in the UK by CFSL under arrangement with the U.S. firm. For its part, Commonwealth is one of the American agents for the Necol Neat/3-to-Cobol conversion package developed by DFSL.

Respond enables the programmer to get a job going with a small fraction of the time and effort required by conventional coding techniques, a spokesman said. The utility is ideal for one-time jobs, for jobs that require quick changes and for jobs that are not run very often, he added.

From that description it would seem the system is easy to use but the results, operationally, are not as efficient as they might be with other programming tools.

Four factors lead to the reduction in development effort, he explained. All data areas are predefined, with known and appropriate initial values, and "suitable automatic operations" are associated with various functions, he said, naming the first two factors.

Beyond that, he noted, a number of instructions, such as "Calculate-check-digit" and Sort, are available. And default options are used "extensively."

Respond costs \$2,000 from Commonwealth at 335 E. Orange, Lancaster, Pa. 17602, or 1,200 pounds (approximately \$2,300) from CFSL in Braemar House on Snelsins Road, Moorend, Cleakheaton, W. Yorkshire BD19 9UE3, England.

File maintenance is accomplished using a fill-in-the blanks display. As many as three keys per record and five fields per key permit rapid access. A global support feature enables users to address selected fields and have appropriate changes made in all affected portions of the data base, he said.

The report generation facilities handle headings, spacing of columns for either print or CRT display and single, double or triple spacings between rows.

Create requires a 64K minicomputer with a disk subsystem, printer and CRT. DG users may license the DBMS for \$10,000 from 159 Gibraltar Road, Horsham, Pa. 19044.

'Foresight' Enhanced

KANSAS CITY, Mo. — The financial reporting and modeling language Foresight has been enhanced and Foresight 6.0, the latest version, is now available through the remote computing services of United Computing Systems, Inc. (UCS).

Foresight is a user-oriented facility that uses ordinary English statements to prepare all types of financial analyses, corporate consolidations and management reports. The system features specialized financial routines, line and bar graph plotting capabilities and a routine for statistical manipulation and forecasting, a spokesman said.

Financial routines include present worth, discount, rate of return, amortize, annuity, depreciate and

spread sheet analyses. Looping, forward or backward iterations are possible with conditional branching techniques, he continued.

The update is said to focus particularly on increased operational efficiency and ease of use. Foresight 6.0 has more powerful computational capabilities, an expanded range of model sizes and a variety of formatting techniques compatible with current financial procedures, the spokesman asserted.

The UCS network is accessible throughout much of the U.S., Canada and Western Europe, with computer centers in Kansas City, Boston and London. The corporation is headquartered at 2525 Washington, Kansas City, Mo. 64108.

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Microterm II Gains Isam, Sort/Merge, Spooler

HORSHAM, Pa. — Indexed Sequential file structures, a sort/merge capability and print spooling facilities are all included in the Advanced Operating System developed by Digi-Log Systems, Inc. for use with its Microterm II microprocessor-based terminal system.

The multitasking operating system also supports an interactive program development system, concurrent teletypewriter or IBM 2780 data communications emulators and an extended Business Basic, according to a spokesman.

The sort/merge is a batch-

oriented capability which enables users to sort floppy disk-based files in place or to create a sorted file in a user-designated destination area, elsewhere on disk or, presumably, printed out on a printer or CRT screen.

The "double-level" sort allows for both primary and secondary keys and for multiple sorts of the same base file to put the data into virtually whatever sequence the user requires, the spokesman added.

The sort utility is an integral part of the Microterm's extended Business Basic; this allows simultaneous file manip-

ulation and data processing as a single programming procedure, he said.

Print spooling on the Microterm, as on most systems, moves data destined for a printer to intermediate storage on disk in order to keep the program that is generating the output executing at its top

speed. The "spooled" output is moved from disk to printer as soon as the hard-copy peripheral is available.

The Indexed Sequential file support was introduced in July to supplement the direct and sequential access methods already available, the spokesman noted.

A 32K-byte Microterm II with an appropriate floppy disk subsystem and the Advanced Operating System software costs \$8,115, with "substantial" discounts available to OEMs, he concluded from Digi-Log's offices on Babylon Road, Horsham, Pa. 19044.

File Techniques Hamper Systems

(Continued from Page 38)

A networked data base structure overcomes this problem. Instead of modeling the organizational hierarchy, we

should focus on profit centers. After all, the system is actually reporting on a profit center basis.

Figure 2 shows the new file structure. The profit center

code is a unique code that rarely changes. Associated with it are division and department designations.

The organizational file (ORGFIL) is "networked" to the reporting file. (PROFITFILE). Simply by keying on the profit center code, the PROFITFILE automatically retrieves the division and department data.

Note that the segment shown with a broken line is retrieved by referencing the PROFITFILE, but on disk it is stored only in the ORGFIL. PROFITFILE is therefore a logical relationship which is physically put together when the report is produced.

What happens now when divisions split or departments merge? The PROFITFILE is not changed at all. The ORGFIL requires a simple update for the new division or department codes.

In fact, it might be convenient to reserve an extra field in the ORGFIL in the event that another organizational level is created, such as corporate groups or subsidiaries.

What if the profit centers split or merge? We can either delete the affected records and reenter them with their new profit centers, or we can write a procedure to reassign the records automatically.

This design has met our first two objectives:

- Figure 2 more closely represents the business problem than Figure 1. As a result, it can handle changes more easily.

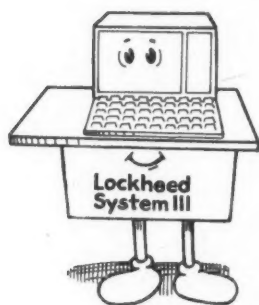
- The design is simplified. The files are flat: no hierarchy is imposed on the data. We have achieved a more elegant solution: a relational network.

One final question may be asked: What are the trade-offs in efficiency in accessing the two files? If we want to retrieve data on only one division, Figure 1 is clearly preferable. But if we retrieve the whole file, this advantage disappears.

There is a cost in file networking. This cost is kept in hand by controlling the runtime environment and by the ability of systems like Ramis II to minimize the number of data base accesses.

As a result, it is usually advantageous to use relational networks whenever possible.

Maverick.



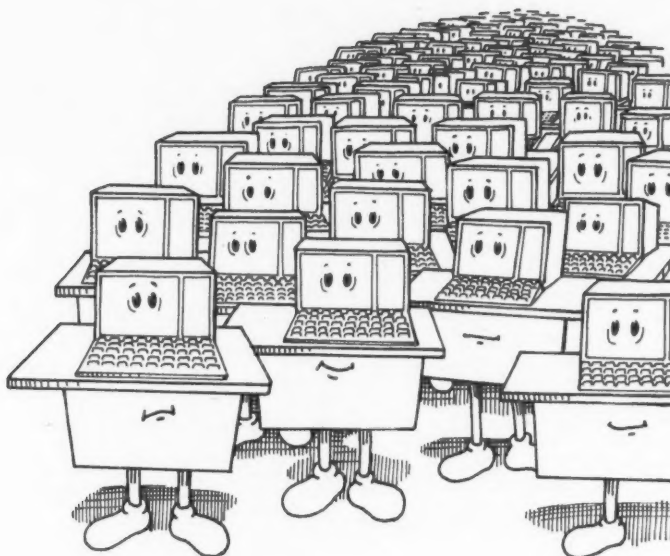
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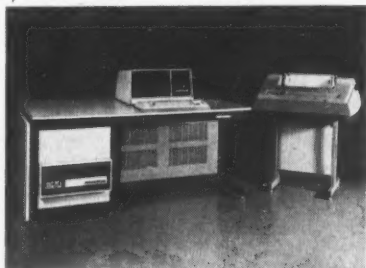
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Lockheed System III

Auerbach Guide Gives Details

Package Studies Must Include Basic Questions

PHILADELPHIA — While many users feel they have special needs — "our situation is unique" — there are basic questions that must be considered, and answers that must be considered unacceptable, in any software evaluations.

The following questions and "screening values" or answer cutoff points were extracted from *The Selection and Installation of Package Systems* published by Auerbach Publishers, Inc.

How well does the package (or alternative) meet the stated needs and objectives? Of course, some "needs" and objectives are nice and some are necessary. Screening value: the package does not meet the needs at all.

How easy will it be to use? Are the inputs simple to prepare? Are the outputs readily understood? Will it present problems such as considerable tape handling for computer operations? Screening value: The package would require unacceptable changes to the way the users or the DP department must work.

What is the acquisition cost? This is not simply the cost of the package. It should include costs for converting files, training all involved personnel and making required modifications to the package as well as any added costs for using it at multiple locations or on multiple machines. Screening value: these costs exceed a predetermined maximum.

What is the operational cost for a year? This figure may be hard to estimate. It would include suitable costs for computer run time, for data entry, for communications, for forms and manuals and for maintenance. Screening value: a cost that exceeds a predetermined maximum.

How flexible is the package? Will it accommodate the changing requirements of the company? Will the item and record lengths permit anticipated (or even unanticipated) changes? Are the file capacities suitable? Does its flexibil-

ity seriously degrade the operation of the system? Screening value: it will not permit anticipated growth or changes.

What is the quality of the documentation? Even if the program cannot be touched, documentation is a must for the users and the operations staff. Since the system was "not invented here," there is no staff member who under-

stands it thoroughly. Hence, the documentation must be good, not just adequate:

- A systems manual describing the systems functions and the functions performed by each program should include a computer system flowchart that shows all inputs, outputs, files and programs.

- A user's manual should describe how to prepare the in-

put, how to use the output and how to correct errors.

- A source listing and a logic flowchart for each program if maintenance is to be done (or allowed) should be included. If the flowchart is not available, then the programs must be extensively annotated.

- Record layouts should define the format and size of each item in the record and

should also specify blocking factors and file-label formats.

- Data entry instructions should be included.

- Operation instructions should include set-up and take-down procedures, operator messages (if any) and actions to be taken as a result, exception procedures and restart procedures.

(Continued on Page 42)

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DBMS Study Offered

MENLO PARK, Calif. — Data base management systems (DBMS) can lead to significant savings in the development of new applications, but the proper selection of the DBMS is the key to the realization of actual dollar savings, according to a study just released by Input.

Potential users are faced with a bewildering array of DBMS products. Input's study presents an evaluation methodology that enables users to identify those products that best match their organization's unique requirements, a spokesman explained.

"Data Base Software: An Evaluation of Current Products and Future Directions" is available for \$2,500. Input's California office is at 2180 Sand Hill Road, Menlo Park, Calif. 94025.

Basic Concerns Must Be Answered In Each Package Study: Auerbach

(Continued from Page 41)

Screening value: minimum documentation is not available.

What support will the vendor supply? Will it help install the package? If so, does the amount of help offered seem adequate? Will it adapt the package for specific needs? If so, how will this affect any maintenance it might provide?

Will the vendor maintain the programs? If so, for how long and at what cost? Will enhancements be provided? If so, at what cost?

Screening value: support that is too costly and/or inadequate to meet the specific needs of the installation.

What is the vendor's reputation? Will the firm be in business next year? If it supplies

maintenance or enhancements, will it be capable of making them? Screening value: less-than-positive information or no information about the vendor.

What is the operational status of the package? How many companies are using it? How long has it been in use? Are the users satisfied? Screening value: varies according to specific needs.

How suitable are the contract terms? Can the package be purchased or only leased? Which approach best suits the needs of the installation? If it is a purchase-only contract, can the payment be stretched out over time?

Are there constraints on the use of the package or on modifying it? Are there extra-cost options? If so, can they be acquired later?

Screening value: one objectionable condition that the vendor will not modify.

Software Tools Seminar Topic

SAN FRANCISCO — An in-depth survey of tools and methodologies to support each major phase of the software life cycle will be presented in a two-day seminar to be offered on a continuous schedule throughout 1978 and 1979, according to the vendor, Software Research Associates.

The requirements/specifications, design, implementation, testing and maintenance phases will all be covered, as will the even more fundamental concern of project management, instructor Edward F. Miller said recently.

The seminars, to be given here in San Francisco, have been scheduled this year in early November and next year in late January, mid-April, early June, mid-September and December.

Additional presentations will be scheduled for the Washington, D.C. area, Miller noted.

Registration fee for the course, entitled "Automated Tools for Software Engineering," is \$425. More information is available from Software Research Associates, P.O. Box 2432, San Francisco, Calif. 94126.

"Our new Fortex on-line credit and A/R system is extremely flexible, highly efficient, and more than fulfills all our requirements."

Donald R. Stoll
General Credit Manager
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Philadelphia, Pennsylvania



Those words, from Mr. Donald R. Stoll, frame an important facet of the Fortex business philosophy. It emphasizes our dedication to system quality, design simplicity and functional output; factors inherent in all Fortex software products.

This particular Fortex system was designed and installed with the total commitment and involvement of the Rohm and Haas MIS personnel and the user group. As a result, said Mr. Stoll, "The CRT's lit up and the system went live in half the time, at half the cost of an in-house program. Because the software package was installed earlier and at lower cost than an in-house system, the payback was greater, and started earlier."

Another extra value of Fortex products is our system simplicity. In this installation it was necessary that end users could obtain and enter information easily, without being aware of the computer's needs. The Fortex C-ARMS system fulfilled that requirement.

We design our Systems with a high degree of flexibility, because we believe a system user should be able to talk "with" a computer...not talk "to" a computer. Talking to a computer complicates performing the job function; talking with a computer facilitates the job function.

Additionally, when a new system is easy to use it

reduces conversion trauma. It requires less training and less mental reorientation. Training and use are simplified because Fortex documentation logically leads the user step-by-step through the process.

So, when your priorities dictate that it is time to evaluate software suppliers, remember FORTEX. Fixed assets, credit or A/R; on-line or batch, Fortex can provide you with a proven modular package that features ease of use, technical support,

quick response, cost savings, DP efficiency and maximum maintainability. Fortex Data Corporation, 10 S. Riverside Plaza, Chicago, IL 60606. Telephone: 312/454-1650.

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On-Line Address Retrieval Phone Firm Net to Speed Client Service

CHICAGO — Central Telephone Co.'s (Centel) Nevada Division is phasing in a computer system able to obtain almost instant plant information on any residence or business customer.

Known as Plant On-Line Address Retrieval Information System (Polaris), it is the first of its kind in the Centel System and may be a first in the industry, according to Paul Sperling, customer service supervisor at the Nevada Division's Service Order Center in Las Vegas.

As an operator keys in an address or phone number, Polaris will provide the number and location of jacks within a home or business, the number of lines, the cable that provides service, the cable pair and the control points to which that pair is connected and left-in station and missing instrument information for each address.

Actual work on Polaris began in May 1977. The entire Nevada Division of Centel will be served

by the system by November, a Centel source said, adding that meanwhile, six specially hired "Polaris clerks" are feeding all pertinent information on about 140,000 customer addresses into the system's memory.

"We feel certain that through this program we will be computerizing all our assignments and services related to customers," Sperling said. "Within the next two years, we can be in a position to have any record relating to services on a computer."

"And once we're totally converted, corporate headquarters will most definitely ask us to implement our system in other divisions," Sperling said. Polaris cost the Nevada Division about \$150,000.

Five Memory Screens

All the pertinent information for a given address is stored in memory under five separate screens or plant files, PF-4, PF-5, PF-6, PF-7 and PF-8. Depending

on the type of information being sought on a particular address, an employee will key in the address or phone number — whichever is readily available — and the PF number. The CRT will display all the information being sought.

For example, if a service representative wants information on the location of jacks at a given address, the representative will key in the address and PF-4 using a terminal keyboard. The screen will then display all pertinent information: type, quantity, location.

If the jacks are in, a customer may select the telephone instruments and take them home, reducing company costs and customer installation charges, Sperling said.

PF-5 contains terminal address data: beginning and dedicated cable/pair, dedicated finder, job number, dedicated telephone number, service order number, service order date, line location

and job date.

PF-6 provides dual service data: cable pair, class service, telephone number, finder, line location and service order number and date. The dual service screen is designed to provide up to 300 dual services, Sperling added.

PF-7 is reserved for missing instrument data, allowing the company to have up-to-date information on such instruments and trace them or document their loss.

PF-8 contains left-in disconnect data. By having the left-in-file information immediately available, Sperling said, the company can keep track of instruments not retrieved when customers terminate their service. Then, when another customer applies for service at that same address, he can be offered the option of accepting the instruments already on the premises.

Again, this reduces installation charges and the company saves the cost of sending an installer to the location, Sperling added.

"Since we started with our dream, we've discovered that we could also use Polaris to give us information on the 'customer will advise' file," Sperling said. That file contains held orders which cannot be completed until the customer is contacted. "This will sharply cut down the number of calls between the service order center and business office."

At the same time, Polaris is sharply reducing the "mountain of paperwork that was absolutely strangling us," Sperling said. Information on filing cards stored in cabinets is being converted nightly so up-to-date information is available the following work day.

Ben Doan, a Centel programmer analyst, prepared the computer program and an instruction handbook to be distributed to employees where terminals are located. Sperling said about 50 CRTs will be located throughout the division's seven-exchange area when the project is completed.

Terminals will be placed in commercial and service centers, business offices, warehouses and accounting offices.

IBM Unveils Non-SNA Model 3274, Dataphone Adapter for Model 1C

WHITE PLAINS, N.Y. — IBM has announced a non-Systems Network Architecture (SNA) local channel version of the firm's Model 3274 control unit for CRT terminals as well as two other control unit products.

The IBM 3274 control unit Model 1D is functionally upward-compatible from the 3274 Model 1B and extends the data handling capability of the 3274 under local channel support by the 3272 station, an IBM source said.

The firm has also announced its Digital Service Adapter for connection of the 3274 Model 1C to the AT&T nonswitched Dataphone Digital Service network. This adapter offers bisynchronous control or Synchronous Data Link Control transmissions at speeds of 2,400-, 4,800- and 9,600 bit/sec, the source noted, adding that the adapter comes in a point-to-point version — the Model 5650 — and a multipoint version — the Model 5651.

IBM also unveiled a Model 3680 encrypt/decrypt feature to extend cryptographic services in an SNA environment to the 3274 control unit Model 1C and its attached terminals — when they are

customized to operate in SNA cryptographic mode.

This feature is for use with ACF/Vtam Encrypt/Decrypt and IBM's Programmed Cryptographic Facility program product to protect data transmitted over communications lines against access by unauthorized users. The feature is based on the federal government's Data Encryption Standard developed by IBM.

The feature is in the 3274 control unit Model 1C, the source stated, and is shared among attached terminals when in cryptographic session with the host.

The 3274 control unit Model 1D has a purchase price of \$18,770 and can be rented or leased for \$490/mo or \$417/mo respectively.

The Digital Service Adapter costs \$840, with rental and lease costs of \$24/mo and \$20/mo. The encrypt/decrypt feature costs \$2,115 or \$61/mo and \$52/mo.

Guide Ready

GAITHERSBURG, Md. — "Packet Data Communications 1978," originally issued in May, has been completely revised.

The 100-page report now available describes packet-switching technology, services that use the technology, the status and plans for public packet-switching networks and related information.

It cost \$225 from Future Systems, Inc., 4 Professional Drive, Gaithersburg, Md. 20870.

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COMMUNICATIONS

Datotek Adds Two Encryption Device Families

DALLAS — Two families of data encryption devices based on a proprietary cryptographic algorithm, rather than the federal Data Encryption Standard, have been introduced by Datotek, Inc.

The Model 26 series provides security for off-line enciphering and deciphering of critical information that must be communicated between field and base station personnel, Datotek said.

The DH-26 handheld encryption unit, normally employed by selected field personnel, is the size of a hand calculator and weighs 1.2 lb, the firm noted, adding this device displays the encryption key in a five-character LED display prior to encipher/decipher operations in either universal or custom

security levels.

Errors are corrected by pushbutton, the firm said, and once a message has been encoded and recorded on paper, it can be radioed or telephoned without compromise to the base station or to another compatibly-coded DH-26 for deciphering.

Typewriter Keyboard

The DC-26 employs a standard typewriter keyboard and a thermal printing mechanism for hard-copy output and also has full enciphering/deciphering capabilities, Datotek said.

When an enciphered message is received, it is typed into the DC-26 in its scrambled format and is deciphered and printed automatically, the firm explained, adding that to generate an en-

coded message, a reverse procedure is utilized after the unit is switched into the "encipher" mode.

Up to eight unique code sets can be stored and accessed by the DC-26. This is said to allow each geographic or functional subset of a communications network to maintain its own key generator independently of other subsets.

With the addition of the TPR-26 paper tape punch/reader unit, the DC-26 base station configuration becomes a complete off-line teleprinter center, Datotek continued. A secure paper tape can be created as a message is enciphered by the DC-26 for subsequent Telex transmission.

The inclusion of both clear and secure information in a single tape is

switch-controlled, and to decode a paper tape message, the tape is simply fed into the TPR read unit, deciphered and printed immediately by the DC-26.

Voice Encryption Unit

The latest addition to the firm's DVP-800 line of voice privacy products is the DVP-810. This unit is a rugged, half-duplex military voice encryption unit built around LSI and microprocessor technology. By using both frequency and time-division processing and a key generator, a high level of voice security is achieved, the firm said.

In addition, excellent deciphered voice fidelity yields high levels of speaker recognition and intelligibility and a special "fail-safe" mechanism disables voice input in case of a malfunction and automatically alerts the sender and receiver of the disruption, Datotek claimed.

Options for the DVP-810 include ac or dc power input, remote tone keyer and decoder, hand and dial telephone sets and a call director. The device can be controlled locally or remotely and is said to be equally effective as a mobile or base station unit.

The DH-26, DC-26, TPR-26 and DVP-810 cost "about \$2,000," "less than \$10,000," "about \$4,000" and \$8,000 respectively, a Datotek source said, noting that actual cost depends on choice of configurations and options.

Datotek, Inc. is at 13740 Midway Road, Dallas, Texas 75240.

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Write, TWX or call Ron Lampe for additional information: Data Terminals and Communications, 590 Division Street, Campbell, CA 95008. (408) 378-1112. TWX: (910) 590-2436.



Coupler Offered For DEC LA36

SAN JOSE, Calif. — An acoustic coupler with TTL for the Digital Equipment Corp. LA36 teleprinter has been announced by Anderson Jacobson, Inc. (AJ).

AJ's Model A 242 A/36 coupler offers full-duplex 103/113 operation at up to 450 bit/sec transmission rates, an AJ source said, adding that the device features a cup design with positive handset lock and direct microphone handset coupling.

Accuracy Feature

To increase accuracy of transmitted/received data, AJ has incorporated quartz crystal-controlled circuitry, double flange seals, special circuitry for reduction of sidetone effects and special rubber feet for extra "vibration isolation," the source added.

Said to carry UL and CSA approval, the Model A 242 A/36 is housed in a compact, lightweight case, the source said.

The device costs \$265 with quantity purchase discounts available, the firm said from 521 Chaucer Ave., San Jose, Calif. 95131.

Correction

An X.25 interface for the Burroughs Corp. B7700 mainframe was incorrectly reported as being available from "Advanced Communications Consultants" [CW, Aug. 21]. The software is offered by Advanced Computer Consultants, 228 E. Cota St., Santa Barbara, Calif. 93101.

Time Factor the Snag

Full EFT Still Impractical, IBM Consultant Says

By Howard A. Karten
CW Staff

WASHINGTON, D.C. — A full electronic funds transfer (EFT) system, in which the account of a consumer is automatically debited and that of the seller automatically credited at the time a transaction occurs, is unfortunately impractical now and for the foreseeable future, according to Frank Backman, a consultant with IBM's Washington Systems Center.

In a paper called "Integrity Management for Electronic Funds Transfer," Backman concluded that "a fully integrated, large-scale, on-line EFT system is still beyond the state of the art" since one of the key elements necessary for the successful operation of the system is missing. That element is an adequate amount of time to complete the transaction "with the appropriate level of assurance that what everyone thinks has been done has indeed been done."

The other two elements required for the ideal EFT scenario, as usually visualized, are quick, reliable, cheap communications between the seller and the buyer's bank and between the customer's bank and the seller's bank. This kind of three-way communication presently exists, Backman said, but is hampered by the delays needed to complete all the communications between parties.

5 or 10 Seconds to Connect

Under optimal conditions, and given a relatively small network of sellers connected to the system, a connection could be established within five to 10 seconds.

However, in a packet-switched network of the type recommended by the X.25 subcommittee of the Consultative Committee on International Telephone

and Telegraph (CCITT), as much as one second of delay could be added by each handshaking procedure necessary for integrity control. This delay would become noticeable, and intolerable, as the packet-switched carrier transmitted each packet through the network, Backman explained.

"The delays implicit in a packet-switched network would appear to be a formidable obstacle to its use in the design of a dial-up EFT system necessary to allow a large number of merchants to access a large number of banks," Backman noted.

"However, as the nodes of the packet-switched networks become more highly interconnected in order to

service increasing demand, the delays may be significantly reduced. The delay may be tolerable when compared with the cost of a short-delay, circuit-switched service that quickly connects a direct path that is held for the duration of the transaction," he continued.

In the end, he added, the value of the merchant's and customer's waiting time — as well as the problem of filling this space and not making the customer feel ill-at-ease — will probably be one of the deciding factors in choosing between these two alternatives.

Additional Delay

An additional delay element in the EFT scenario is verification of author-

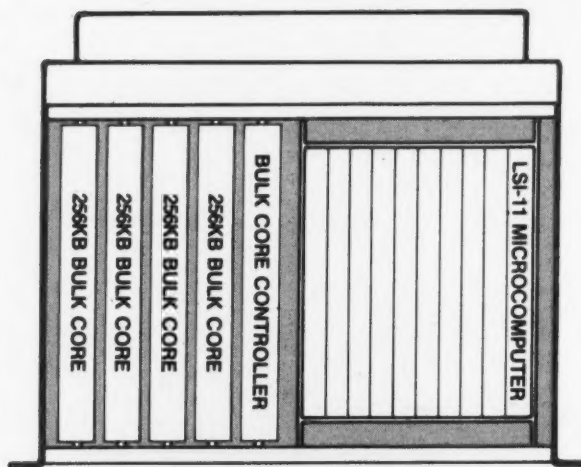
ized users. Clearly, each merchant must be known to its supporting bank; however, the cost of maintaining a file of merchants — and of updating that file as additional merchants are added — is precluded by the present cost of (disk) storage. Although an extra CPU could handle the problem of connecting the merchant and the customer's bank, this method would induce still more delay, regardless of the technology used in the connection.

An additional wrinkle in this identification problem is security: although intelligent terminals and procedures could do the look-up operation off-

(Continued on Page 46)

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Terminal Serves TWX, Bell Nets

HOUSTON — A high-speed teleprinter mated with a data regeneration data set, the Omnitec 4911, has been introduced by Tel-Tex, Inc. This dual-use communications terminal services the TWX data network and the Bell network in any combination as required by the user, Tel-Tex claimed.

The terminal features a 4,000-char. memory buffer with incremental expansion to 16,000 characters for editing and transmission functions, and an automatic receive capability for editing and transmission functions, and an automatic receive capability is offered as an option.

Uses DEC Printer

The Digital Equipment Corp. LA36 Decwriter II teletypewriter, interfaced with the Omnitec 4911 data set, reportedly operates on the TWX network at 100 word/min and on the Bell Telephone network at 100- or 300 word/min.

The TWX and TWX/Direct Distance Dialing models are both available. Cost of the 4K model terminal is \$3,995 and a variety of acquisition plans with rental, lease/purchase or outright purchase programs are available, Tel-Tex said from 3203 Audley, Houston, Texas.

France: YREL, 33-9502224 • Italy: Macronics Italia, 35 36 041 • Spain: Apoca, 34-1-4575312 • Sweden: M. Stenhardt AB, (08) 739 00 50 • Switzerland: ADCOMP AG, 01/730 48 48 • United Kingdom/Ireland: Sintrom Ellinor Ltd. 44-734-85464 • West Germany/Austria: O.E.M.-Elektronik GmbH 49-711-798047/48 • Australia/New Zealand: Anderson Digital Equipment, 61-3-5432077 • India: Industrial Electronic Instruments, 79281 • Israel: Integrated Systems Ltd., 921513 • Japan: Matsushita Electric Trading Co., Ltd., 81-3-4354552 • Taiwan/Republic of China: Syscom Computer Engineering Co., 02-7026284/85.

HIS Releases Net Software For HDLC

PHOENIX — Honeywell Information Systems, Inc. has announced the availability of Release NT2 of its Network Processing Supervisor (NPS) from its software library. NT2 provides the initial support for High-Level Data Link Control (HDLC), which is the native protocol for the HIS Distributed Systems Environment.

The HDLC interface supports the Remote Network Processor (RNP) Phase 3 and the Level 6 Multifunction System, HIS source said.

NT2 will operate on a Datatnet 355, 6600 or 6678 attached to a Series 6000 or Level 66 non-distributed processing system (DPS) Gcos system. A separate version of NPS, release DP1, will be provided for use with the Level 66/DPS, the source added.

The NPS release NT2 is available immediately at no cost to users, while the HDLC option costs \$90 a month.

Full EFT Not Feasible Yet

(Continued from Page 45)

line, this approach will probably be rejected in the future as having inadequate security.

"The establishment of permanent connections is crucial to minimizing the handshaking delays in an EFT network." However, fully and permanently connecting all parties involved is impossible, since there are so many parties, he noted.

"The success of a large-scale EFT system still seems to depend on the organization and integrity management of a network of a relatively small number of powerful installations, rather than on the independent operation of merchant-operated terminals and banks, regardless of how smart the individual terminals and bank computers may become in the near future," Backman said.

Auerbach Publishers, Inc. has made this report available for \$260, the firm said from Pennsauken, N.J.

Unit Suppresses Power Transients

LOS GATOS, Calif. — A power line suppression device to reduce downtime on computers and communications equipment, available as a field retrofit or OEM component for use in power supplies, has been introduced by Panamax.

The shunt-fed Panamax 120 VSP costs \$65 and is sold through R&K Enterprises, 405 Alberto Way, Los Gatos, Calif. 95030.

Telenet Expanding 1,200 Bit/Sec Service

VIENNA, Va. — Beginning this month, the Telenet packet network will provide nationwide communications service for data terminals operating at 1,200 bit/sec.

The expanded public dial-in facilities for 1,200 bit/sec terminals will support the Bell 212 full-duplex modem and will be made available locally in selected major cities as well as nationally through a central Telenet Wats number, a Telenet source stated.

The cities in which public 1,200

bit/sec service is already available include Boston, Chicago, Dallas, Honolulu, Los Angeles, New York, San Francisco and Washington, D.C. Local dial-in service is expected to be available by October in Houston and Newark, N.J. and by November in Atlanta, Detroit, Houston and Philadelphia.

Nationwide Wats access is scheduled to begin Oct. 1.

A recent survey among the more than 225 organizations that use Telenet for

computer communications showed a growing preference for 1,200 bit/sec service, according to Ralph R. Johnson, Telenet's vice-president for marketing. The reasons cited were higher throughput and lower cost compared with lower speed terminals.

In addition to its public dial-in service for terminal users, which is charged on an hourly basis, Telenet also provides dial-in and leased-line service for terminals operating at speeds up to 1,200 bit/sec.



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Protocol Enhancement Offered for Spinwriters

LEXINGTON, Mass. — NEC Information Systems, Inc. has introduced an X-ON/X-OFF protocol enhancement for its Spinwriter series of bidirectional character printers.

The feature complements the ETX/ACK protocol and reverse channel protocols currently available for the hard-copy terminals, according to a spokesman. It will be offered as an operator-selectable option on Spinwriter models

5510 and 5520 at no additional cost, he noted.

"Many popular minicomputers use the X-ON/X-OFF protocol. X-ON/X-OFF support for Spinwriters allows users to optimize throughput without special software drivers," the spokesman said.

The protocol allows Spinwriter printers to accept "unblocked" data streams from processors. That incoming data is stored in buffer mem-

ory immediately prior to printing, NEC said.

As the buffer approaches saturation, the Spinwriter transmits an X-OFF code, indicating that the processor should stop transmitting. The Spinwriter continues to print that data it has already received and stored in buffer memory, the spokesman explained.

When approximately three-fourths of that buffer space is

empty again, the printer transmits an X-ON code, indicating the processor should begin transmitting data once again. The X-OFF code is also transmitted whenever the Spinwriter cover is opened, paper runs out or the ribbon requires replacement, he said.

The Spinwriter series consists of two terminal models and an OEM version, each capable of printing bidirectionally at speeds up to 55

char./sec.

The "thimble" element used by the microprocessor-controlled printers lasts up to 50% longer, prints faster and costs less than competing daisy-type print elements.

Dual-font thimble elements designed especially for word processing applications are available in addition to single-font elements.

Spinwriter terminals with the X-ON/X-OFF protocol are priced at \$2,775 for the receive-only Model 5510 and at \$3,090 for the keyboard send/receive Model 5520. Those prices are for single-unit quantities.

NEC Information Systems is at 5 Militia Drive, Lexington, Mass. 02173.

PROBLEM:

Many customers form their first impression of your company by phone. Busy signals can hurt your sales. A client who has to spend a long time waiting on "hold," or who gets cut off, might go to your competition.



Your phone system may also be making it more difficult for your staff to communicate with each other. Dialing and re-dialing busy numbers or waiting for a clear outside line wastes valuable time.

A system that's not up to date may also require more operators than a new system, operators who could be contributing more to your bottom line in other jobs.

SOLUTION:

A modern voice communications system can solve a lot of problems. For example, we have a Dimension® PBX feature that can reduce sales lost to busy signals by uniformly distributing calls on a next available basis.

We also offer the office-based professional systems that include our Com Key* telephone system which provides direct dialing, paging, music on hold, conferences on intercom and other features.

Our voice systems can improve your efficiency, reduce communications costs and build profits for businesses big and small. And solve problems for banks, supermarkets, hotels, boutiques, manufacturing firms—any enterprise.

We design systems to meet your specific needs. If you haven't talked total communications with your problem-solving Bell Account Executive, you're missing something—in voice, data, and network services, or their just-right combination.

The system is the solution.



Com Key 416



Bell System

Unit Records From Loggers

BALTIMORE — The Model 300C data cartridge recorder from Columbia Data Products, Inc. is said to register data from most data loggers equipped with RS-232 or current-loop interfaces.

The Model 300C features remote or manual control, the firm noted, and offers rates up to 19.2K bit/sec and a storage capacity of 1.5 million characters.

A switch permits the unit to record in an "endless loop" fashion, allowing the previous 1.5 million characters to be stored, the firm explained.

Dual ports enable the device to be connected in series between a modem/CPU and a data logger.

Priced at \$1,995, the Model 300C is suitable for CPU program loading and other applications requiring digital data storage, the firm said from 6655 Amberton Drive, Baltimore, Md. 21227.

Brochure Details System 4000

MIAMI — A full-color brochure from Racal-Milgo Information Systems, Inc. presents the benefits of the firm's System 4000 intelligent clustered terminal system.

The brochure is available free from the firm at 8600 N.W. 41st St., Miami, Fla. 33166.

WOW! LOOK!



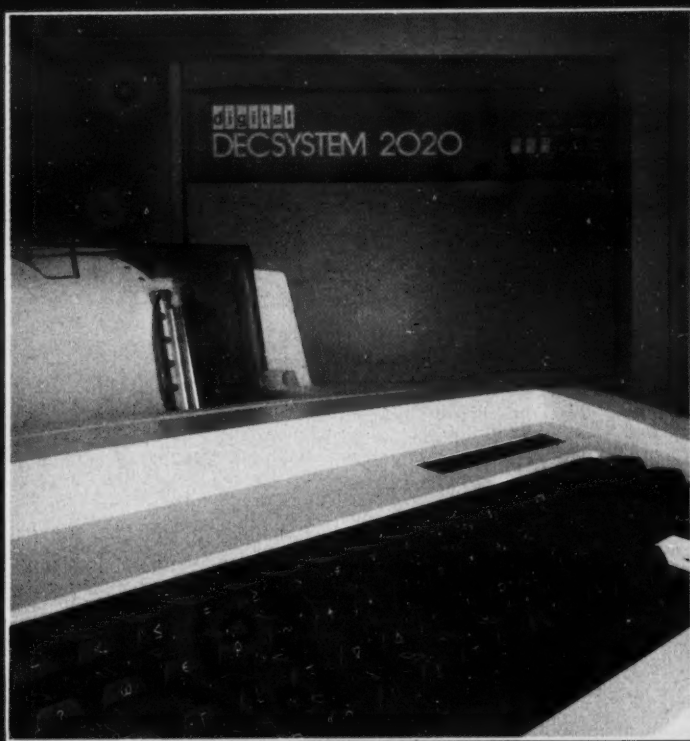
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FCC's Fogarty to Address Nata Meeting in November

WASHINGTON, D.C. — Commissioner Joseph R. Fogarty of the Federal Communications Commission (FCC) will address the North American Telephone Association (Nata) convention here in November, according to John McShea, president of the association.

Fogarty, a commissioner since 1976, has been one of the influential voices in the shaping of a national telecommunications policy which has led to increasing competition in the phone industry, McShea said.

The four-day Nata convention will open Nov. 15 at the Hyatt Regency Hotel here.

Also on the speakers list is James

Lovell, the former astronaut, who currently is president of Fisk Telephone Systems, Inc. of Houston. Lovell is a Nata board member.

Sen. Edward Kennedy (D-Mass) has been invited to speak at the convention of manufacturers and contractors who sell telephone equipment and systems in competition with the Bell System and other telephone utilities.

The FCC first opened the industry to competition in 1968 with the Carterfone Decision. Tom Carter, whose suit broke the historic Bell monopoly, is to attend the convention as a special guest.

Datagroup Offers Terminal With 100 Char./Sec Speed

BOUNTIFUL, Utah — The 100 char./sec Datawriter III keyboard send/receive (KSR) terminal has been introduced by Datagroup, Inc.

The terminal transmits 128 standard Ascii characters typed on an 80-key alphanumeric keyboard with numeric/function keypad, the firm said.

Using impact technology, 95 printable upper and lower case Ascii characters, plus a special APL character set, are printed in a 7 by 7 dot matrix at 13.6 characters/in. Up to 136 single-width characters per line are printed at 6 or 8 line/in. with vertical spacing, allowing up to 68 lines of 136 characters to be printed on 11-by-.5-in. paper.

Double-width printing may be se-

lected or deselected at any point during the print line. The printer accepts multipart continuous forms from 3- to 12 in. in width and accepts a widely available cartridge ribbon.

Form feed and set top of form are standard features on the Datawriter III, a spokesman noted.

Transmission occurs at rates from 110- to 9,600 bit/sec over RS-232 or current-loop interfaces. The terminal buffers up to 255 characters in internal memory and has facilities to indicate buffer status to a host processor, the firm said.

Parity select/on/off, here-is (transmission of half- and full-duplex terminal serial number), terminal self-test and terminal restart are standard features.

A set of internal switches select power, transmission rate, line parity, half-or full-duplex, autoline feed, character set (Ascii or APL) and buffer status indication technique, Datagroup noted.

Design Simplicity

The terminal is said to feature high reliability because of design simplicity. All electronics are reportedly on a single module with the print head of "field-proven reliability."

The main terminal cover need only be removed during installation, maintenance or ribbon changing, the spokesman said. Forms may be changed without removing the cover.

A removable, clear noise reduction printing area cover provides a view of the last line and character printed, the firm claimed, and a page or more remains "clearly in view" after printing.

The OEM pricing schedule "approaches" \$600 in quantity, Datagroup said. The end user suggested price is \$1721.

Until Nov. 15, Datagroup is offering the unit at a special one-unit introductory price of \$796.

Datagroup is at 811 S.500 W. St., Bountiful, Utah 84010.

Monitor Works Without Modem

HORSHAM, Pa. — A data link monitor that operates synchronously without an external modem clock has been introduced by Digi-Log Systems, Inc.

The DLM II is available with an optional internal clocking feature that allows the device to operate in clocked links with conventional modems, the firm said. DLM II can thus be configured to work in both environments.

The DLM II can accommodate up to five code sets by addition of translator features and presently is offered with nine different code translators. A programmable companion unit called Tapetrap can trap and store up to 1 million characters of data and protocol characters on an endless magnetic tape loop.

The stored characters can be searched and viewed on DLM II at operator speed, a spokesman noted.

The DLM II costs \$2,945; discounts for quantity orders are available. The internal clocking option costs \$200. Digi-Log is at Babylon Road, Horsham, Pa. 19044.



Good news and bad news for 370 and 303X users.

First the bad news. You can't run your faithful 1400 series programs because IBM has eliminated the emulator.

Now for the good news. Dearborn has a new simulator—SIM-14/Version 4™—that will let you run your 1400 programs on any 370 or 303X . . . without re-programming!

More good news! SIM-14/Version 4 means no re-programming for users of the new AMDAHL, CDC and ITTEL plug-compatibles.

SIM-14/Version 4 also lets IBM 360/370/303X users run multiple programs simultaneously.

All of which means that if your new whizzer has made your trusty 1401, 1440 or 1460 programs old before their time, our new simulator will give them a shot in the arm with features like...

...support for 1400 utilities and sort

replacements; no control storage or micro codes; no hardware restrictions other than decimal arithmetic set; full tape and disk support; a self-relocating problem program that's completely interruptible...

And more. It's all in our "Good News" manual. Ask for it. It's free. But for the best news of all, ask any of our offices how fast—and inexpensively—SIM-14/Version 4 can bring your 1400 programs back from early retirement.

SIM-14/Version 4.

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**“As NCR promises,
our conversions have been
problem-free and fast,” says
Tom Crabtree of Pier 1 Imports.**

DP MANAGER CRABTREE: It's hard to believe our volume has grown so fast that this NCR Criterion is our fifth system since 1970. And our improvement in productivity has been even more dramatic. Our year-end-closing program – just five years old – once took 12 hours. Now it runs in just 18 minutes.

DP OPERATIONS MANAGER CORMIER: Our last upgrade was impressive just by itself.

CRABTREE: It was. Our figures tell us that we achieved a 38 percent increase in thru-put when we went from the NCR Criterion 8550 to the 8570.

CORMIER: As you know, the biggest job we have is maintaining a perpetual inventory on close to half-a-million items – 1650 items in each of the 275

stores. We updated 13,000 items an hour on the 8550. We are doing 30,000 an hour on the 8570. That really takes the pressure off. And the transition was smooth, too.

CRABTREE: They all were. As NCR promises, our conversions were problem-free. We just moved the new equipment in and the old equipment out. And that was all there was to it.

CORMIER: The big advantage is that we upgrade only when we are experiencing an overload and have no time available for recompiling and the other usual conversion chores. NCR's Migration Path Engineering helps us at a time when we are desperate for help.

CRABTREE: We are going to have the same kind of transition when we install VRX – NCR's Virtual Resource Executive. Plus another 20 percent increase in thru-put.

CORMIER: It will really make the system easier to operate.

CRABTREE: It sure will. You will be able to run up to 35 jobs at one time. VRX will allocate memory and resources automatically. And automatically schedule jobs to cut down the demands on the operators. It will handle memory swapping. It will even watch for memory thrashing and program loops – and will automatically alter the job mix to eliminate these problems if they occur. The key word is – automatically.

In the NCR office near you, there is an account manager who can assure you of effortless upgrades, once you are on the NCR path.

To learn more about what an NCR system can do for you, phone your local NCR office. Or write to EDP Systems, NCR Corporation, Box 606, Dayton, Ohio 45401.

Thomas F. Crabtree, Jr. (right) is Data Processing Manager of Pier 1 Imports, Inc., a national chain of import stores. Donald Cormier is Data Processing Operations Manager.

NCR
Complete Computer Systems

See NCR systems in operation at INFO 78, Booth No. 298.

Concentrator From Micom Gets Option

CHATSWORTH, Calif. — Micom Systems, Inc.'s Micro800 data concentrator now has a synchronous channel option.

For applications requiring that one or two synchronous channels be multiplexed along with the asynchronous channels concentrated by the Micro800, the option splits the high-speed line data rate into subchannels operating at one quarter, one half or three quarters of the composite data rate, Micom said.

One of these subchannels is used for the concentrated asynchronous data. The Single Synchronous Channel Option, Model 800/S, allows multiplexing of one synchronous channel with the concentrated asynchronous data.

The Dual Synchronous Channel Option, Model 800/S2, allows multiplexing of two synchronous channels, supporting high-speed line data rates up to 19.2K bit/sec.

The Model 800/S costs \$400, while the Model 800/S2 costs \$600, the firm said.

Also offered to Micro800 users, the "August Product Update" from Micom describes two recent features introduced for the Micro800 — the synchronous channel options above and the Terminet option, which provides support for General Electric Co. Terminet printing terminals [CW, Aug. 28].

The update is free to Micro800 users, Micom said from 9551 Irondale Ave., Chatsworth, Calif. 91311.



'We've Done It — The Ultimate in Display Terminals.'

168

System available for short term sublease.

COMDISCO
312-698-3000

Disposable Cloths Clean CRTs

HILLSDALE, N.J. — A presaturated, disposable pad for cleaning CRT and computer output microfilm (COM) viewer displays has been introduced by the Texwipe Co.

Clearview Terminal Wipes remove dust, fingerprints, smoke and other vision-inhibiting contaminants from CRT screens without harming terminal surfaces, Texwipe said.

The hermetically sealed, foil-wrapped Terminal Wipes are treated with a fast-drying, nonstreaking solution, the firm said. Each pad delivers a

premeasured amount of cleaning solution onto the screen, ensuring that no excess solvent leaks into sensitive equipment to cause operator shocks or short circuits.

Increased Legibility

Cleaning CRT and COM screens with these pads increases readout legibility, reduces operator eye fatigue and decreases errors, Texwipe claimed.

Terminal Wipes are packaged in 72- and 720-pad boxes and are also featured in Clearview Terminal Cleaning

Kits, which contain selected products suited to the customer's situation, the firm indicated.

Each kit includes 72 pads, 150 lint-free cloths for drying and polishing screens after pad applications and a static neutralizing cloth to prevent build-up of dust-collecting static charges.

The 72-pad box of Terminal Wipes costs \$11 and the 720-pad box costs \$75. Free samples packets are available on request from Texwipe through P.O. Box 278, Hillsdale, N.J. 07642.

Announcing The 150-cps terminal

It impacts your workload. Not your wallet.

Meet the newest member of our OMNI 800* family: the Model 820 KSR Impact Terminal. It has all the features, functions and options of costly multi-copy terminal printers. But not the price tag.

The 820 comes with standard equipment that's setting new industry standards. So, join us for a short

demonstration and we'll show you what we mean.

An operator's dream.

First of all, you'll note that the new 820 has an efficient, compact design with a keyboard resembling that of a standard typewriter. So, it can sit on a desk top or stand. And it's easy to use. In operation, you'll see one of the first features: a 9 x 7 dot

matrix printhead that prints clear, legible characters. On both the original and up to five copies, too. And a wide carriage that prints forms from 3 to 15 inches in width — up to 132 characters across — at 150-cps speed.

Now, notice the 640-character FIFO buffer. It channels data so



With Throughput Increase Front-End Mini Cuts Communications Costs

By Jerry Rish
Special to CW

Think of some of the biggest DP problems facing financial institutions and service companies today:

- Growing on-line terminal networks that generate more transactions than present systems can handle, resulting in slow response time, poor throughput on background

processing or lengthy lead times for adding more terminals or lines.

- Expanding point-of-sale (POS) and automatic teller machine (ATM) operations which demand costly 24-hour host computer operation and expensive processor duplication for backup.

- Attractive bank mergers and acquisitions that suddenly

turn sour when it is realized that whole terminal networks would have to be replaced to assure CPU capability.

- Merchant resistance to exclusive POS installations which serve only the customers of one financial institution.

Now, start thinking small. The solution to all of those problems can be an inexpen-

sive front-end communications system. With efficient software, a minicomputer with disk support can eliminate between 30% and 40% of CPU overhead by handling all data communications functions. Terminals can be added without affecting memory, stabilizing future memory requirements. Throughput can be improved 30% to 100%.

POS and ATM applications may be handled exclusively by the minicomputer with the addition of applications programs. As an alternative, the mini can handle processing at night from available balance files, when the CPU goes off-line. The mini also provides inexpensive backup for the central processor any time of day.

Because the front-end controller can communicate simultaneously with different manufacturers' terminals and processors, mixed terminal networks are feasible.

There is also a very practical way to convert from one system to another. In a POS or shared ATM environment, the system can be used to switch a transaction to the appropriate data center and host computer for processing.

Saturation Point

The processing saturation point for a system varies according to the efficiency and power of software and hardware. Generally, small in-house host computers become swamped by the communications overhead associated with as few as 50 to 100 terminals. Larger systems may start running into serious difficulties when the terminal network includes between 200 and 300 units.

Whenever this saturation point — with its degraded service and expansion ceiling — is reached, financial institutions and service centers often feel that upgrading to a more powerful mainframe or purchase of a second CPU are the only options.

But users are enjoying high profits and efficiently serve large networks using hardware that has been fully depreciated. For example, the Pan American Systems Corp. (PAS) communications system has increased older and smaller CPUs' transaction capacity to the point where hardware which might otherwise be obsolete is performing without difficulty. Supported by PAS software, the system incorporates the Univac V77-600 minicomputer as well as the Univac data communications multiplexer with asso-

(Continued on Page 54)

the 820 KSR. with more impact.

it's printed at maximum efficiency, either uni-directionally or bi-directionally. And the buffer provides overflow protection so you won't lose any input.

Status symbols.

Left of the keyboard you'll notice a three-digit L.E.D. Terminal Status Control panel. But it won't confuse you. It shows you the printer's next position. Or the terminal's status. Or an appropriate code when you have an error condition. It eliminates all the guesswork.

You'll also see Answerback Memory, on our Model 820 KSR. Plus a view mode that lets you check on the last character printed.



Maintenance in minutes.

To simplify maintenance, we've reduced the number of basic components to just four: the motherboard/microprocessor, the keyboard, the print/drive mechanism and the housing. The majority of which can be replaced in minutes.

Making the most of your options.

To increase its performance even further, the 820 is available with optional compressed character font, ASCII/APL keyboard, an 18-key numeric cluster, and a powerful device/forms control package.

Far-reaching support.

Every OMNI 800 Model 820 Impact Terminal comes with TI's over 30 years of experience in the electronics industry. Plus the technical expertise and support of our worldwide organization of factory-trained sales and service engineers, and



TI-CARE†, our nationwide automated service dispatching and field service management information system.

To see how much more impact our new impact terminal can have on your workload, call the TI sales office nearest you, or write Texas Instruments Incorporated, P.O. Box 1444, M/S 7784, Houston, Texas 77001, or phone (713) 937-2016.



More impact with our printhead.

Also, there's the wire matrix assembly-designed printhead. It's specifically designed to increase printing life to 150-million character impressions. And our new extra-length ribbon allows the printhead to make more strikes per ribbon.

Yes! I am interested in the Model 820 KSR Impact Terminal.

- ☐ Please have your representative call me.
☐ Please send me more information.

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Mini-Based Front End Can Boost Throughput

(Continued from Page 53)

ciated communications line adapter.

A typical question posed by many people exploring the possible advantages of a front-end processor is: "What happens if we exceed its capacity? Can more than one front-end device be linked to a single CPU?"

That question has proved to be irrelevant for PAS customers. The firm has data centers which currently handle 1,500 terminals, 100 lines and peak volume loads of 25,000 to 30,000 transactions per hour without difficulty. PAS has not yet encountered a CPU that could handle more transactions than its system.

How does this communications system reduce CPU overhead and provide better network control? With typical

data communications hardware and software, a CPU goes through a series of electronic "handshakes" each time it talks to a terminal. The CPU performs about 1,000 operations to send or receive a message.

However, if a CPU is front-ended by the PAS system, the CPU is only required to read and write complete messages. Also, with the PAS system, the CPU thinks it is reading to or writing from a magnetic tape unit, eliminating data communications hardware and software. The messages are stacked up for the computer to access one at a time with the simple magnetic tape program.

The network is controlled by the front-end processor by polling. When a terminal message is received, it is

structured into a standard application message. For example, passbook transactions might be received from several types of terminals. Varying codes and formats would make the messages look very different.

But the input and output format routines PAS provides for each terminal type and application would make the passbook messages from the different terminals appear identical to the CPU.

The PAS system interfaces with CPUs manufactured by Burroughs Corp., IBM and NCR Corp., as well as virtually every commercially available terminal. The result is total terminal independence and, conversely, processor independence. Users can select terminals strictly on the basis of their features and/or costs. Mixed networks

are completely feasible.

A bank, for example, might wish to acquire a smaller bank as a branch office. Assume the bank has one DP system and the proposed branch has 25 teller terminals from another manufacturer. Ordinarily, the acquisition of the branch would obsolete the terminals, requiring a write-off in the neighborhood of \$200,000. An additional \$12,000 to \$15,000 would have to be invested in each new terminal.

With the PAS communications control system, the old terminals would not be replaced. Data centers with a need to interface with different terminal types would benefit in a similar manner.

Many PAS users use the communications system to process POS and ATM transactions and to provide inexpensive backup for CPU on-line processing.

Two Approaches

They have taken two different approaches. First, applications programs can be added, allowing POS and ATM networks to be processed completely by the minicomputer. PAS has POS and shared ATM installations which do not interface with a host computer.

The files are kept on disk and the minicomputer does all the on-line updating. The PAS check authorization system is totally on disk, operates 16 hours a day and handles nearly one million accounts.

In the second situation, generally an ATM environment, the CPU processes transaction on-line during the day and the minicomputer simultaneously updates an available balance memo file to operate with at night. All extended-hours transactions are processed by the minicomputer working against actual account balances. When the CPU comes back on-line the next morning, the transaction file is passed to the CPU and the CPU file is brought up-to-date.

In both situations, customers have eliminated the need to keep a large CPU on-line 24 hours a day — a very expensive and next-to-impossible proposition. Users already involved in on-line networks gain this added processing capability and backup for the on-line CPU at practically no cost.

With such communications control systems, large volumes of data from remote sites may be collected on-line and stored. The data can be sent by the remote center at any convenient time and held for CPU processing when sufficient memory is available. Memory doesn't have to be reserved at specific times.

When memory does become available, the information is input in a high-speed burst instead of being fed in through a low-speed communications line. After processing, the reports can be dumped back to the minicomputer for formatting and return to the remote printer terminals.

Lower costs, higher throughput and better system availability, flexibility and efficiency are all within reach of oft-strained, DP operations.

The key, once again, is to think small. A minicomputer with disk support and efficient software make up a formidable and inexpensive front-end communications system.

Rish is president of Pan American Systems Corp., Winter Park, Fla.

ATTN: 3270 USERS

Here's a *tailor-made* system to fit the requirements of your job today. In addition, BRAEGEN's multi-tasking intelligent controller offers the flexibility you will require in the future. **Systems Programmers**, in particular, find the following features very valuable.

Both Local and Remote 3270 are available, of course,

PLUS

Local Job Entry. Line printers up to 1200 LPM with 1403 addresses and card readers with 2501 addresses can be placed next to any BRAEGEN CRT. These "hot" printers and readers are located in the users' areas up to 7,500 feet outside the computer room. Most popular uses are for programmer listings and accounting work. Users get the benefits of increased productivity because turnaround time is reduced to minutes.

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Address Switching. Any BRAEGEN CRT terminal provides as many addresses as required for Console, TSO, Applications, etc. Any CRT can have both Local and Remote addresses. This feature can reduce the number of CRT's required and will eliminate NCP,

VTAM type software overhead requirements.

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Multiple Controller Interfaces. The BRAEGEN controller allows multiple channel and remote interfaces. Any CRT can access multiple local IBM CPU's or remote CPU's. Just 2-3 seconds to switch a CRT between CPU's or addresses.

PLUS

Fast Cursor, Programmable Keyboard, 7500' Coax,

Multiple Drops per Coax, Wide range of speeds in 3286/3288 compatible printers; from 45 cps to 1200 LPM, Offline Data Entry, and our Offline TSO Editor.

PLUS

Features others have promised for 1978-1979 are **AVAILABLE NOW . . .** Local Copy, 128 character set CRT, Typamatic keys, Home key, etc.

PLUS

Low Prices — 1, 2, 3 year leases available.



Customers throughout the U.S. are benefiting from these features now. For more information please write or call; The BRAEGEN Corporation, 20740 Valley Green Drive, Cupertino, California 95014. (408) 255-4200.



BRAEGEN

In College Environment System Serves Naive, Advanced Users

Special to CW

PORTLAND, Ore. — The fall of 1976 marked the beginning of a new era in education for students at Portland State University (PSU). The institution began providing academic computing services for its students in both day and evening classes.

The university's eight schools and colleges offer 33 master's degree programs and three interdisciplinary doctoral programs. Sixteen thousand students are registered in the day and evening schools.

Student DP has been provided by means of a Harris Corp. System 200 which is dedicated to academic use, with both time-sharing and batch capabilities. This equipment can be accessed by 30 terminals to provide research and instructional services.

The system, a Model 220, has been part of a Harris pilot program for Version 05A of the System 200 operating system. That software system was made fully operational at PSU prior to its general release across the country.

According to Lee Wood, manager of academic services in the computing services center, student and faculty acceptance of the system has been excellent. Average connect time per month runs between 4,000 and 5,000 hours.

Computer users fall into three categories: those with a technical orientation, those "uninitiated" and those involved in research. While the sophisticated users make up only a small portion of the student population, they make the greatest demand on the sys-

tem in terms of CPU capabilities, using high-level languages and programs and requiring very little consultation.

The uninitiated users, commonly working in Basic, take up the bulk of computing time and require more assistance.

Researchers, meanwhile, are also a relatively small portion of users at the present time and typically work with the system's library of programs to solve statistical problems.

Among Wood's responsibilities as manager of academic services has been the development of a library of applications software, particularly in support of instructional and research efforts. The library presently includes a variety of programs that are ac-

(Continued on Page 64)

Service Boosts Data Entry Performance

Special to CW

TUSTIN, Calif. — A DP service firm, formed for the purpose of auditing and reviewing billing for workers' compensation, has found that performing data entry on a distributed system instead of keypunch equipment saves money both for the firm itself and the insurance carriers it serves.

Fee schedules and rules for payment of industrial accident claims by insurance carriers vary from state to state and are, in general, extremely complex and difficult to process fairly and efficiently. The primary source of difficulty is interpreting the rules of compensation for services to their medical providers. State medical associations publish relative value reports that are periodically updated as necessary, which compounds the problem.

The fair interpretation and implementation

of fee schedules requires an in-depth familiarity with an immense volume of rules and numbers, combined with a general medical background. Historically, however, this task and its responsibilities have been borne by insurance companies and their billing examiners. The results have been largely inconsistent and contradictory and have created a chaotic situation from the point of view of the provider.

Medata has reported a good performance record in throughput, accuracy, turnaround time and error and cost reductions.

The hardware responsible for Medata's success is a Sycor 440 distributed DP system comprised of two 440 processing units with floppy disk drives, a bidirectional printer, a 300 line/min printer, a magnetic tape drive, two 10M-byte hard disks and 10 CRT terminals.

The printer and magnetic tape drive are switch-selectable to either 440, allowing optional simultaneous operation of two printers. Seven CRTs are used for data entry with one 440. The second 440 manages three terminals and the bidirectional printer, which perform additional in-house functions.

All system software was written by Medata personnel in Ansi-level Cobol for speed and efficiency.

Former Situation Hectic

Prior to leasing the system, Medata's typical work day was hectic. "When we first began, we were a keypunch operation; and it was a horrendous process," Ron Taylor, vice-president of DP, recalled.

Essentially all claims arrived by mail each

(Continued on Page 70)

Unique System Aiding Energy Research

LOS ANGELES — A radically new type of system has gone to work at the University of California at Los Angeles (UCLA) to help science crack one of its toughest problems — how to harness thermonuclear forces to provide mankind with a source of unlimited, clean energy. The raw material for the big payoff, controlled thermonuclear fusion, is plasma — a hot, electrified gas that makes up 99.9% of the universe and fuels the energy released by the sun.

A basic understanding of plasma processes is the key to making fusion energy a reality, and one of the main efforts in the country in this area is being conducted by professors and students at the UCLA Center for Plasma

Physics and Fusion Engineering.

One way to understand the processes involved is computer simulation, an approach pioneered by physicist John M. Dawson, director of the center, 17 years ago. However, even the most powerful commercial DP system available today can't cope with the vast number of interactions of plasma particles. Over the years, to reduce the problem to manageable proportions, Dawson has created and refined mathematical models of the process, constructed of equations, which provide a simplified yet realistic simulation of the real thing.

"Plasma, the 'fourth state of matter,' is terribly complicated, far more so than air or

water," according to Dawson, who added that his model is "somewhat like a public survey in which interviews with 2,000 people reflect the behavior of 200 million Americans. Except that in our case, it's akin to learning not only what people are doing now, but how they'll behave 50 years from now."

However, as Dawson evolved more sophisticated models, going from a one-dimensional simulation of plasma processes to two dimensions and recently to three dimensions, his computing time and expense on the large IBM computer at UCLA went up.

(Continued on Page 68)

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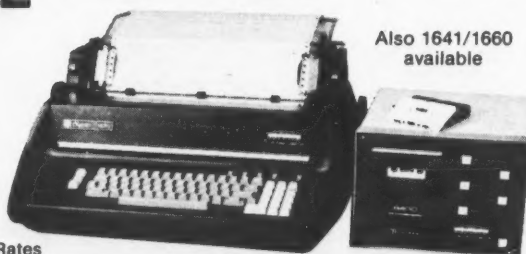
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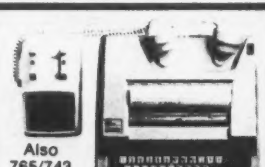
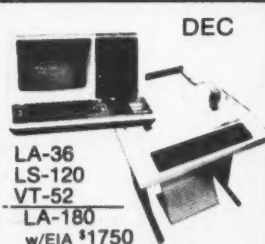
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First Step in \$7 Million Plan

RPI Kicks Off DP Upgrade by Installing 3033

TROY, N.Y. — Computing capabilities at Rensselaer Polytechnic Institute (RPI) took a quantum jump recently when the switch was thrown on its IBM 3033.

The \$3 million CPU is the first step in a \$7 million program that will put the university's computing capabilities at least on a par with those of the nation's leading universities. The 3033 is 10 times more powerful than the IBM 360/67 it is replacing.

Whereas the 360/67 could handle the input from 40 terminals before bogging down, the 3033 can handle 400 terminals.

In addition, the 3033 is 1.8 times as powerful as IBM's previous largest

model, the 370/168.

In terms of internal memory, the 3033 will hold 4 million bytes; the 360/67 had a capacity of 1.5 million bytes.

Second University User

RPI was the nation's second university to receive the 3033. Last month, Louisiana State University had one installed and Penn State will soon receive its 3033. The first 3033 installation was made at Singer Co.'s corporate data center in Wayne, N.J. in April.

Installation of RPI's unit began July 12 and took three days. On July 15, RPI began running test programs, and

at 2 p.m. on July 19 the 360/67 was shut down and the 3033 officially went on-line.

The 3033 is expected to serve RPI for the next five to seven years, James L. Moss, director of computer services, said. It was selected by a computer study task force as "the most satisfactory unit" available.

During the next three years, RPI will add \$1.75 million worth of peripheral equipment. This year, additional disk drives will provide 1.8 billion bytes of on-line storage, an increase of 600 million bytes over the present capability.

In addition, this year, the 30 existing "public" terminals that serve students and faculty in general will be increased

to 50 and 55 additional "private" terminals (used by individual professors and administrators) will bring the total to 100. Public and private terminals will grow at a rate of about 50 units each during both 1979 and 1980, bringing the total number of terminals close to the CPU's capacity. The new terminals will include CRTs and hard-copy devices.

To complete the upgrading program, RPI will begin remodeling a former chapel and library building as a computer center. Work on that is to begin this fall, with completion set for next summer. The remodeling project, to cost \$2.25 million, will bring the total investment in new equipment and housing to \$7 million. RPI will have a computing facility with a net worth of about \$10 million, including its new 30-terminal interactive computer graphics center and other departmental computers.

The university's computing service staff is also growing. At a present level of about 30, including several new positions, the staff will soon increase to about 40 in order to handle increasing activity.

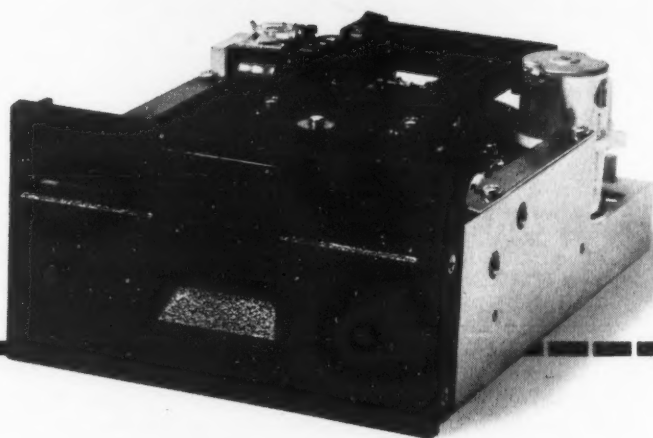
Moss explained why there is a need for such sweeping improvements at RPI: "In the last two years here has been a 15-fold increase in the number of student terminal sessions. Two years ago, only 5% of the computer's time was taken by student terminal sessions; last year it was 35%.

"We expect an annual increase of 35% for the next two years until we reach a 50-50 balance between terminal and batch sessions. This will enable every one of our students to have a half hour of computer time in daily terminal sessions."

The increase in terminal sessions "reflects changing technology," Moss said. "Students are now far more oriented toward sitting down at a terminal and doing their work." Currently about 75% of RPI's 5,300 students use the computer each semester, and virtually every student uses it sometime during his academic career, Moss reported.

"Our intention is to have all our of students become 'computer literate' — to know what they can and cannot do with computers — because they'll be living with them all their lives. All a computer can do is move and manipulate information; the true capability of a system lies in the user's imagination," he noted.

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| Head Life | 20,000 hours (normal use) |
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Punch/Splicer Added by Datacq

MONTEREY, Calif. — A 12-channel tape punch for preparation of format control tapes for line printers has been introduced by Datacq Corp.

The Model 1400 punch/splicer features bidirectional tape travel with positive indexing. The punch will prepare control tapes for printing forms with either six or eight line/in. by means of a selector lever, with tape alignment and perforation guaranteed to meet or exceed industry standards.

The device sells for \$195 from the company at P.O. Box 3223, Monterey, Calif. 93940.

The Structured Forum is coming your way!

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Edutronics/McGraw-Hill and Structured Methods present The Structured Forum

The Structured Forum

Structured Methods and Edutronics/McGraw-Hill are pleased to be co-sponsoring the Structured Forum — a one-day review of the major structured design and development methodologies with special emphasis on the development of the human resources needed to install these new techniques effectively. Conducted between Thanksgiving and Christmas, the Forum will include an in-depth look at the differences, as well as the similarities, between the data flow and the data structure design approaches. In addition, the link between system design and database design methods will be explored.

To represent a broad cross-section of methods, we've invited representatives from the leading consulting/training organizations in the U. S. to present their own particular design orientation. We've also invited a local speaker in each of the 18 Forum cities to present a luncheon address on a timely topic related to software development.

The Dates

| | |
|--------------------------|-------------------------|
| New YorkNov 28 | DenverDec 11 |
| BostonNov 29 | Kansas City . . .Dec 12 |
| TorontoNov 30 | DallasDec 13 |
| DetroitDec 1 | HoustonDec 14 |
| ChicagoDec 4 | St. LouisDec 15 |
| Minneapolis . .Dec 5 | AtlantaDec 18 |
| SeattleDec 6 | Columbus, OH .Dec 19 |
| San Francisco .Dec 7 | Wash., DC . . .Dec 20 |
| Los Angeles . .Dec 8 | Philadelphia . .Dec 21 |

The Program

The agenda for the one-day Structured Forum will consist of presentations on:

Warnier/Orr methodology by a representative of Langston, Kitch.

Jackson Design methodology by a representative of Infotech International.

Constantine/Myers/Yourdon methodology by a member of the Structured Methods staff.

Database Design by a member of the staff of DBD Systems.

Human Resource Development in a Data Processing Environment by a representative of Edutronics/McGraw-Hill.

Attendees will be provided with all Forum materials including the conference proceedings. A buffet lunch will be served and all attendees are welcome to join the speakers in informal conversation during a wine and cheese gathering following the presentations.

Registration

To register for the Structured Forum, or for any of our other courses, you can write or call collect. Registrations

may be cancelled at any time up to the last business day prior to the first day of a course. Structured Methods does not impose any cancellation fee, provided the above condition has been met.

The fee for the Structured Forum is \$175 and groups of three or more will receive a 10% discount. All attendees will receive a \$100 credit which can be applied toward Structured Methods or Edutronics services or against a list of selections from the McGraw-Hill Computer Science Library.

To reach us by phone, you can call us collect at . . . 212 — 355-2520, or you can call us at one of our local numbers:

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New Courses

In addition to conducting the Structured Forum, Structured Methods is introducing four new courses this fall.

Reviews, Walkthroughs and Inspections will demonstrate that peer reviews improve product quality through discovery and elimination of errors. Participants will learn to communicate effectively with one another in the peer review environment, they will gain the knowledge necessary to conduct appropriate peer reviews during system development, and will become aware of potential problems and possible solutions.

Modern Systems Development - A User Perspective will help the non-technical business staff understand their role in systems analysis and throughout the systems development life cycle. Participants will be familiarized with the processes and tasks of the life cycle, and will be taught the documentation techniques and strategies of structured analysis.

Comparative Design Methodologies is a three-day course intended to increase your awareness of software design theories and practices through a comparison of Infotech/Jackson, Warnier/Orr, and Constantine/Myers/Yourdon design methodologies. Three instructors, each an expert in a different one of the methodologies, will be on hand to conduct the course.

Quality Assurance & Testing Workshop will teach the attendee how to integrate the testing function into the entire development life cycle, with special emphasis on the use of the cause and effect graphing technique to validate the completeness of the business requirements documentation and the code analysis technique to determine the impact of change on existing systems.

Seminar Schedule

| COURSE | DAYS | FEE | OCTOBER 1978 | NOVEMBER 1978 |
|--|------|-------|---|---|
| Reviews, Walkthroughs and Inspections | 2 | \$325 | 5-6 Chicago | 13-14 San Francisco |
| Modern System Development — A User Perspective | 2 | \$325 | 26-27 Washington, DC | 2-3 Chicago |
| Comparative Design Methodologies | 3 | \$575 | 25-27 Chicago | 8-10 New York |
| Quality Assurance & Testing Workshop | 5 | \$625 | 30-11/3 Boston | |
| Managing Systems Development — A Structured Approach | 2 | \$325 | 2-3 New York 5-6 Dallas 30-31 Chicago | 20-21 Los Angeles 20-21 Kansas City 20-21 Cincinnati |
| Introduction to the Tools and Techniques of Structured Systems Development | 1 | \$175 | 4 New York 4 Dallas | 1 Chicago 22 Los Angeles 22 Kansas City 22 Cincinnati |
| Structured Design | 3 | \$475 | 2-4 Phoenix 2-4 Atlanta 30-11/1 Denver 30-11/1 New York | 6-8 Dallas 13-15 San Diego 27-29 Chicago |
| Structured Analysis | 2 | \$325 | 5-6 Phoenix 5-6 Atlanta | 2-3 Denver 2-3 New York 9-10 Dallas 16-17 San Diego 30-12/1 Chicago |
| Structured Analysis/Design Workshop | 5 | \$625 | 9-13 Seattle 16-20 Boston 30-11/3 Kansas City | 6-10 St. Louis 13-17 New York 27-12/1 Toronto |
| Structured Design/Programming Workshop | 5 | \$625 | 2-6 Minneapolis 9-13 Denver 16-20 Washington, DC 30-11/3 Cleveland | 6-10 Phoenix 13-17 Boston 27-12/1 San Francisco |
| Structured Programming for COBOL Programmers | 2 | \$325 | 12-13 Pittsburgh 12-13 Kansas City | 20-21 New York |
| Structured Programming for PL/I Programmers | 2 | \$325 | 25-26 Los Angeles | 20-21 Chicago |
| Infotech/Jackson Design Technology Workshop | 3½* | \$800 | 9-14 San Francisco | 13-18 Washington, DC |
| Data Base Package Analysis and Selection | 3 | \$475 | 16-18 Chicago | 6-8 Washington, DC |
| IMS/VS Data Base Design | 5 | \$625 | 30-11/3 New York | 27-12/1 Boston |
| IMS/VS Programming | 5 | \$625 | 16-20 Seattle | 6-10 Chicago |
| Data Base in a Distributed Processing Environment | 2 | \$325 | 16-17 Dallas | 6-7 Washington, DC |
| Data Base Management Systems for Minis | 3 | \$475 | 18-20 Dallas | 8-10 Washington, DC |
| A Comparative Analysis Systems Design in a Data Base Environment | 2 | \$325 | 30-31 Boston | 13-14 San Francisco |
| Designing Effective Data Bases | 3 | \$475 | | 1-3 Boston 15-17 San Francisco |

*Monday through Friday, Saturday morning and three evenings during the week

Fees include all class materials, lunch, continental breakfast and coffee breaks

Course registrations for groups of 3 or more are entitled to a 10% discount

Registration for consecutive courses:

| | |
|--|-------|
| Structured Analysis & Structured Design | \$625 |
| Data Base in a Distributed Processing Environment & Data Base Management Systems for Minis | 625 |
| Systems Design in a Data Base Environment & Designing Effective Data Bases | 625 |

In-House Policy

Structured Methods offers all of its courses on an in-house basis. Furthermore, we are able to tailor any course to meet a client's specific needs. For more information, call us. We will be happy to provide you with prices, references, and scheduling information.

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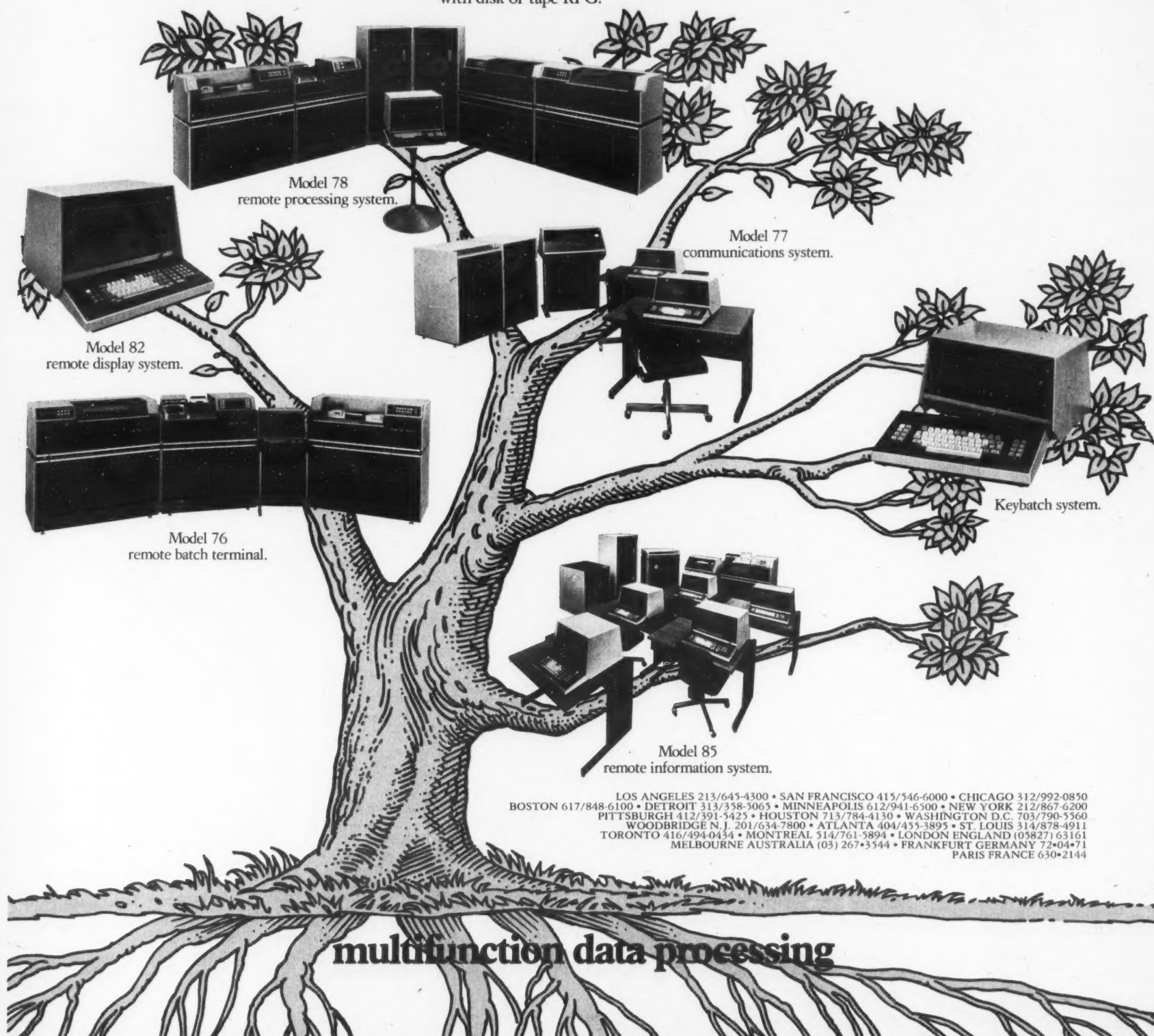
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Mother Nature, DP Join in Inventory Control

SALEM, Ore. — Mother Nature and computer technology have combined their resources in an effort to help the State of Oregon's Department of Forestry maintain more effective control of its inventory. The inventory — 786,000 acres of state-owned timberland — is unduplicated in the U.S.

Mother Nature's part, the production of nearly 225 million board feet of lumber each year, is regularly monitored by foresters on their timber cruises — site visits to timberland designated for public sale. The computer's part is the calculation of the effective yield, in board feet, of the proposed acreage.

The information which the computer processes comes from statistical samples gathered on the proposed sale site. The input from foresters includes such factors as tree species, diameter, height in number of logs, cruise point, merchantable top, trim lengths and other information on the county, township, range, section number and cover description.

The data, on the handwritten cards, is sent from the field to Salem, where it is entered into a Data 100 Corp. Keybatch system. Three data entry operators use typewriter-like keyboards to key in information on the system's CRT screens.

At the same time, the 10M-character disk-based system performs preprogrammed edit routines to ensure that the data is correct. The data then is transmitted over telephone lines to an IBM mainframe for final processing.

Operators More Relaxed

The chief advantage of the system, according to Paul Ennor, programmer/analyst for the Department of Forestry, is the accuracy and speed with which the data is processed, allowing forestry officials to provide reports to the public on the probable amount of board feet and revenue dollars that the predominately Douglas fir timberlands will yield.

Ennor said those factors were the primary justifications for replacing the department's previous system with the key-to-disk system in 1976. "We were not only saturating our

keypunch operators," he noted, "we were also running out of room to store the card data and running out of print-

ing a third more work than previously. Special jobs such as recording data on five million seedlings for state-owned

in their stride.

Besides allowing operators to enter data faster, the key-to-disk system also provides more accurate results because of its ability to do range checking and table lookups, Ennor said. "So if we incorrectly enter an employee number, the machine immediately identifies the error. We still have data entry errors," he noted, "but when we do, we usually find that the operator

correctly keyed in the source document and that the source document itself is wrong."

In all, Ennor said, the process allows each partner to do what it does best: Mother Nature provides the trees, key-to-disk technology provides the data management capabilities and the Department of Forestry provides the expertise for the best utilization of Oregon's timberland.

Data Entry Dimensions

ing capacity on our IBM 3780."

The operators are more relaxed now, according to Ennor, even though they are do-

nursery orchard farms used to be a headache, Ennor said — and an overtime headache at that. Now the operators have the free time to do special jobs



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With Help of Service

Insurer Puts Four Dozen Reports on COM

ATLANTA — "We've converted virtually every computer report needed by an insurance company to computer-generated microfiche."

That is a sweeping statement, but it gives an idea of the scope of the computer-output microfilm (COM) program at United Family Life Insurance Co., headquartered here.

"Almost four dozen of our computer reports — more than 1.5 million original pages annually — are produced on microfiche," according to Frank Curl, assistant vice-president and office services administrator for United Family Life.

Administrative accounting reports such as payroll and trial balance ledgers, as well as policy loan history records, agents' collateralization reports, transaction and commission registers, weekly reports of agent activity, reference files of all policies and the statistical record for each agent are just a few of the weekly and monthly computer reports that have been converted to microfiche, Curl said.

In the actuarial department alone, he added, 250,000 pages of listings are replaced each year by 1,200 original COM fiche.

United Family Life's microfiche is produced by the Atlanta service center of Computer Micrographics, Inc., a Los Angeles-based micrographics service company.

The service firm "picks up our magnetic tape at the end of every week or month, depending on the report, and updates our records as needed. In the case of the weekly reports, by the time we return to the office on Monday, it has the microfiche waiting for us to use," Curl said.

Operating Costs Reduced

In addition to improved efficiency in data retrieval, United Family Life, a medium-size insurance firm with more than a half million policyholders, has been able to reduce operating costs significantly, Curl said.

"We generate more than 1.5 million original pages of computer printouts every year.

"Now, the same data is produced on more than 8,000 original microfiche and more than 90,000 duplicates each year," he explained. "We have saved several thousand dollars annually in paper costs alone."

Another cost saving benefit United Family Life has realized is the elimination of a 16,000 sq-ft storage area that was maintained for old files.

"This alone saved us \$8,000 a year in leasing costs," Curl noted. "For example, instead of consuming space with 18 four-drawer file cabinets in our premium accounting section, we are literally able to keep current records in the top drawer of a desk."

For each report converted to micro-

Four-Phase Users Set Meeting Next Week

NEW YORK — The Four-Phase Users Group has announced that it will hold an open meeting here Sept. 20 at the Hotel Lexington. Ed Fiest, author of *The Fiest Report*, will be the guest speaker.

Additional information is available from Peter C. Daikos at P.O. Box 902, New York, N.Y. 10008.

fiche, Computer Micrographics produces a varying number of duplicates — anywhere from three to 30 — for United Family Life's internal use.

"We also send the weekly reports to our three field vice-presidents," Curl said.

"Eventually, we plan to expand the fiche program to all 20 of our regional offices, too."

Smooth Conversion

The actual conversion to COM-generated fiche at United Family Life went very smoothly, the executive added.

"There were only minor changes needed in our computer program and, as far as money was concerned, the

only investment we had to make was for the 95 viewers we bought, and those are relatively maintenance-free," Curl explained.

How did the 200 home office employees of United Family Life react to using microfiche as a replacement to printouts?

"This was originally one of our biggest concerns and, as it turned out, one of our biggest surprises. When we initiated the program, we expected some resistance to the drastic change in procedure.

"But because of the easy access to the data on fiche, our people have adapted to, and feel more comfortable with, microfiche than they ever did with the clumsy printouts," Curl said.

Unit Warns Of Storms

FORT ATKINSON, Wis. — An indicator that can detect electrical storms within a 30-mile radius, potentially disruptive to computer operations, has been introduced by RAK Associates.

The Model MK Sferic detector has indicators that visually and sonically warn of approaching storms. A green indicator and an audible alarm flash and chirp in proportion to the intensity of a storm; a meter on the face of the unit provides an additional measure of storm activity.

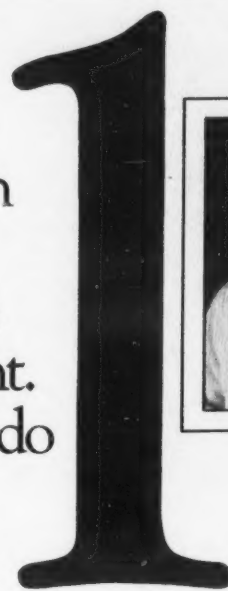
The unit sells for \$289 from RAK Associates at P.O. Box 222, Fort Atkinson, Wis. 53538.

"If you're scared,
you make a decision
that's safe.

If not, you make
a decision that's right.

What we try to do
is remove the fear."

Tom Knight
Product Manager



370 Add-on Memory

"We really believe that you can't do better than National's add-on memory for your IBM 370 computer. And so do a lot of other people. So I tell customers, 'look, right now there are hundreds of IBM 370's in the field using National Semiconductor memory. If you haven't heard our name it's only because until now, we haven't been selling directly to end users.'

But we actually have a larger share than anyone else in the 370/158 and 168 add-on market. We've delivered over 1200 megabytes. And with 30% of our business today going

to upgrading existing customers, we must be doing something right.

Now, National is offering 370 add-on memory direct — both the 158 and 168 models, as well as our Universal Memory, which interfaces with IBM's 135, 138, 145, and 148 processors.

I really believe we know more about 370 memories than even IBM. Because not only do we have to know intimately every component that goes into our products, we also have to know the IBM CPU's to which our products attach. This knowledge lets us make our memories less expensive

Mainframe Plays Part in Changes of Air Fares

By a CW Staff Writer

WASHINGTON, D.C. — Virtually all the fare data for airlines regulated by the Civil Aeronautics Board (CAB) in this country funnel through the Airline Tariff Publishing Co. (ATP) here.

The 10-year-old company, which is owned and operated by the major U.S. and Canadian air carriers, is responsible both for filing proposed tariff changes with the CAB and for getting that data, once approved, to airlines, travel agents and other parties that use it. To do that, it uses a 500K-byte IBM 370/138, operating under DOS/VS, the usual complement of tapes and disks and a specifically-designed print chain.

All tariff data on file with the CAB is

maintained by the company on a multireel file. When an air carrier wants to change a fare, it notifies the company, specifying the new fare either exactly or parametrically.

The latter specification can typically take the form, "Recalculate the fares between cities A and B on the basis of the fare between cities C and D except if they are outside of the range of E and F" and so on; it is used because of the highly complex nature of the fare calculation.

"The airline industry couldn't exist today without the computerization of tariffs," according to ATP President C. Crowell Squire. "There aren't enough people available who could make all these changes in a reasonable time."

The company made seven million

fare revisions last year, printing over 46,000 pages to contain the changes.

From Liability to Asset

After the fare revisions are approved by the CAB, master pages containing the changes are sent to New York City for printing and distribution to travel agents and airline agents, who subscribe to the service. Computers are used here, too, to reduce the expense of distribution.

The printing process provided one of the company's greatest challenges, and one that the company managed to turn from a potential liability into a real asset.

"The CAB is very sticky on the subject of printing and clarity," according to Bill Smith, ATP's director of sys-

tems. "If the type is not clear or the letters are broken up, CAB rejects the page and it must be reprinted."

In addition, CAB rules require underscoring after a certain number of lines. All of this made for one big, potential headache for the company, since conventional underscoring took a whole line, while underscoring without spacing could result in confusion.

To meet this challenge, company officials worked with IBM to develop a new typeface. In the process, the stroke on the characters was widened, which necessitated wider hammers on the printer.

Savings of \$500,000

The special type font and printer modifications cost the company approximately \$13,000, but the company saved more than \$500,000 in printing and reproduction costs last year alone, Smith recalled.

This savings occurred because the company can now print 15 fewer lines per page, which in turn means fewer pages to print and distribute.

The system being used by ATP was designed more than 10 years ago, Squire noted; the original design has not been altered since then.

"We spent a tremendous amount of time before getting into a computerized environment. If we learned anything, it is that exhaustiveness before you leap is probably worth 10 times the return you think it is."

"We are now redesigning the system, not because it is essential, but because we feel it is creaking and there are areas where we could conceivably get caught short. We feel it is about time to catch up with technology," he concluded.

Booklet Details Output Systems

SANTA CLARA, Calif. — "Output Systems for IBM 360/370," a 16-page brochure from Versatec, describes three output systems providing print and plot capabilities for applications such as computer-aided design, mapping, business graphics and printing.

The three system configurations — on-line, off-line and remote job entry (RJE) — accept vector data for electrostatic plotting without excessive CPU or I/O overhead, according to the company.

On-line systems emulate IBM 3211/3811 or 1403/2821 printer/controllers, while off-line systems accept vector, raster or print data on IBM-generated tapes.

Selection Chart

Included in the free booklet are specifications for 47 of the company's printer, plotter and printer/plotter models.

A model selection chart provides a way of comparing resolution, plotting speed, width, input data rates, print speed and columns per line.

In addition, the brochure describes the plotting software used with the three systems and provides sample output and diagrams of hardware operation and software organization.

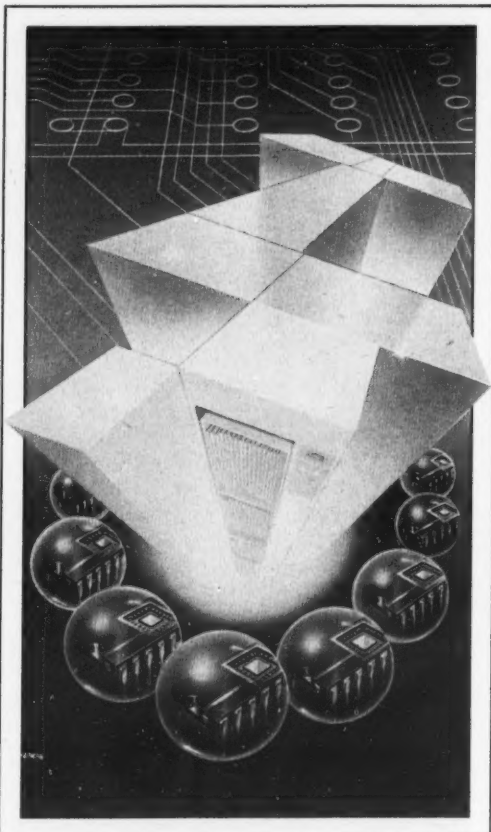
The booklet is available from the company at 2805 Bowers Ave., Santa Clara, Calif. 95051.

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We understand the "safe" feeling you get by going with IBM memory. But consider. National has a bigger market share than any other independent supplier. We've been deeply committed to 370 add-on memories for years. We can meet all your 370 add-on requirements, whatever they may be, now and in the future.

If you still feel safer with IBM memory from IBM, fine. But if you want to take that bold, bold step and find out more about IBM System/370 add-on memory from National, contact me personally: Tom Knight, Product Manager, National Semiconductor Corporation, Drawer 5, 2900 Semiconductor Drive, Santa Clara, California 95051."

Computer Products Group
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Tape Cleaner Includes Footage Counter

WOODLAND HILLS, Calif. — A magnetic tape cleaner from Data Devices International features a footage counter to record the distance between beginning and end of tape markers, a rotary self-sharpening cleaning blade and an automatic packer arm system.

The Mark X tape cleaner also features a tape reel protective shroud

to eliminate many of the problems caused by operator handling, a twin-blade cleaning system that provides four separate cleaning phases during each cleaning cycle and front service access to the device, a spokesman added.

The device costs \$3,695 from the company at 6301 De Soto Ave., Woodland Hills, Calif. 91367.

CARD-READER TERMINAL

P1-14



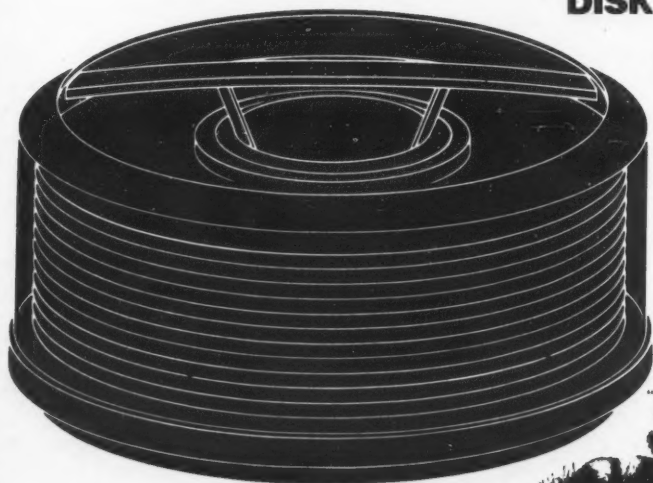
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University System Serves Sophisticated, Naive Users

(Continued from Page 55)

cessed using a simplified system of macro instructions. These enable the user to step through a sequence of definitions which narrow to his area of interest or go directly to the program he intends to use.

CPU, Terminal Arrangement

The Harris system and a number of Digital Equipment Corp. Decwriter terminals and keypunch units are located in a central facility. Other on-line terminals are scattered around the downtown campus. Working memory for the operating system, program library and student programs is contained on disk storage.

The Harris system was installed in an old PSU building that dates back to the 1920s. Almost since the system was first put into use, it has been surrounded by remodeling activity, with high levels of dust and debris. Heating and ventilation ducts are a constant source of dust particles.

With dust as a possible contributing factor, the system was plagued with disk problems earlier in the operation and nonrecoverable errors resulted. System managers were faced with a choice of replacing damaged disks (with attendant downtime costs) or putting up with reduced disk capacity because of damaged areas.

The dust problem also caused contamination of heads in the disk drives. According to Darold Barrow, DP operations manager for the school, it was decided to try 3M Co. disk packs because of their reputation for resistance to headcrash damage and lack of oxide-to-head contamination.

PSU had been using 3M 701 "Blackwatch" tapes for some time, enjoying very low error rates compared with other products and that experience prompted Barrow and his associates to explore the 3M disks as a possible solution to the serious disk problem.

"We are extremely pleased with the performance of the 3M disks," he reported, "especially considering our earlier damage problems and the contamination situation."

The school uses 3M 949/80 disk packs for the original 80M-byte drives and the 3M 949/300 for the recently installed 300M-byte drive.

Barrow noted that close support from 3M's Portland representative has been an important factor in successful use of the tapes and disk packs.

Special Challenges

Dr. R. Enburg, PSU director of computer services, noted that there are unique challenges in the management of an academic system. "We have a very wide scope of users in terms of assistance required and types of programs run. This diversity complicates the matter of consultation services, since it is necessary for us to provide assistance for a majority of our users."

He went on to note that system use is cyclical in both the short and long term. There is typically heavy use by more users near the end of an academic term and when upper level students are running programs. In particular, there is a concentration of use near the middle and end of each term when users, in standard student fashion, hurry to complete course work.

"The kind of use to which our system is put," Enburg said, "dictates that we incorporate a large amount of open memory. A student may come in early in a term and capture a segment of storage for this program, and that information will remain in active memory for a number of weeks, essentially untouched and infrequently used."

"One of our challenges for the future is to develop a means for easy output and portable storage of such data so that our heavy memory load is reduced," he noted.

On a philosophical note, Enburg credited the system with breaking down the "psychological" barrier that separates average students and staff members from the world of computers.

Positive Attitude

"Our interactive terminals and Basic language help new users understand that the computer is simply a tool and not some imposing technical threat," he noted. "We find that new, positive attitudes are fostered when people get hands-on experience at a terminal." Enburg hopes that removal of this "psychological barrier" will have a positive effect on general attitudes toward DP as more and more students reach the work force.

As Enburg noted, the Harris system memory was quickly taxed by heavy student use and the need to hold large quantities of data for long periods of time between use. As configured in September 1976, the system had three 80M-byte disk drives for overhead and working memory. A 300M-byte drive was added recently to bring total system capacity to 540M bytes, effectively quadrupling the working storage available for student use, since very little of the added disk area was taken up by overhead.

Future Plans

The success of the dedicated academic computer system at PSU has led DP managers there to plan for several innovations in the future. The campus in Portland is relatively small in total area, and it is likely that a hardwired network will be installed to make DP capabilities available to virtually any location on campus. With that expansion will come the addition of terminals and possible remote minicomputer access.

There are currently several stand-alone minicomputer installations on campus, serving as data collection systems and as facilities for operating system study. Communications between the main academic system and these and other minicomputers will expand their usefulness to individual departments. Cost for such implementation should be minimal compared with the initial system expenditure.

After only a year of operation, the dedicated academic system has proven to be useful and practical. Problems of implementation and utilization have required the concentrated efforts of a number of specialists.

Many of those problems will be ongoing as the user base is constantly renewed, but Enburg and his staff have high expectations for the future of academic computing and for its contribution to the quality of education here.

DP Provides Navy With Valuable Audit Tool

Following is the second of a two-part series detailing the complex auditing procedures and channels of operation practiced within the U.S. Navy's Naval Audit Service.

By Oliver W. Parson

Special to CW

Computers, although usually the focus of each auditor's scrutiny, also play a significant role within the Naval Audit Service and in the auditing function itself.

In addition to portable terminals, the service has installed intelligent computer terminals in each of its four regional offices and one at the department's headquarters in Washington, D.C. The terminals — located at Camden, N.J.; Virginia Beach, Va.; San Diego, Calif.; and Falls Church, Va. — are all connected to a central computer center. This provides the capability of tying the regional offices and headquarters together in one network.

The Navy's computer audit system is divided into four major, functional areas. The first, the Naval Audit Service Management Information System, is designed to automate and facilitate audit planning, monitoring and implementation. It is also designed to satisfy related external reporting requirements.

The Management Information System is also separated into two subsystems. The Progress/Status Reporting Subsystem and the Plans/Inventory Subsystem.

The Progress/Status subsystem contains a data base of all ongoing and planned audits within the Naval Audit Service. This particular subsystem has the capability of producing reports that are used by both the headquarters and the regional offices. Basically, this data base is used to provide timely, pertinent information for reviewing audit plans, assessing progress and adjusting plans to reflect the impact of changes.

All input data directed toward this subsystem is loaded through terminals located at each regional office as well as at headquarters. Through batch processing, the data base is updated to maintain the file's current status. Every two weeks, a series of management reports is generated from the data base by programs, executed on overnight turnaround and transmitted to the terminals in each regional office.

The Plans/Inventory subsystem contains a data base of all naval activities that have the potential to be audited by the Naval Audit Service. The system is controlled and updated by the central

Device Feeds Fiche Shredders

MONTREAL — Datatech Business Machines, Inc. has introduced a device to feed microfiche shredding equipment automatically and continuously.

The device, which attaches to the company's Micro 006 shredder, can stack 70 to 140 pieces of fiche, microfilm, aperture cards, film spools, paper and tab cards.

The desktop unit, which runs on standard current, costs \$900 from Datatech at 8270 Mountain Sights Ave., Montreal, Canada H4P 2B3.

office in Washington and is designed to keep a history of audit performance of each activity.

Programs are generated from this data base, producing management reports, and these reports are printed via terminal at each operational division.

Long-Range Functions

Teleprocessing and long-range computer-assisted auditing is conducted by the Statistical/Analysis branch of the service. Field auditors at the regional offices can select, via portable time-sharing terminals, numerous centrally stored software programs which provide statistical auditing samples. The programs are written in "conversational" language, allowing even the novice auditor to access and understand the system.

The computer itself is also used as an effective tool by nearly all the auditors working for the Naval Audit Service. Auditors use a system to perform such functions as selecting data for audits, analyzing the selected data and performing clerical functions that would otherwise have to be done manually.

The particular hardware/software system used by the service was selected for its ability to process more than one file (for matching purposes); its ability to add, subtract, multiply and divide within single records and across records from two files; the system's adaptability; and, of course, its ease of use. Cost was also a significant factor during selection because of various budgetary restrictions.

To date, the Navy's computerized retrieval system, containing assorted auditing programs, has been used for inventory control, financial management, personnel and almost every functional area involved in management audits.

Training Aspects

Training is the final, and perhaps, the most important aspect of the Naval Audit Service's computer network. Field and novice auditors are instructed in the use of computerized comprehensive interactive statistical packages which allow data to be entered, stored and analyzed using simple commands.

Trainees are introduced to the DP system's statistical capabilities which include basic statistics, analysis of variance, cross tabulations, nonlinear transformations, nonparametric statistical testing, regressions and comprehensive plotting capabilities.

Novice auditors must participate in both a five-day Cobol training course (which is the primary language used in all of the service's computer facilities) and a five-day information retrieval course.

The Cobol course hopefully provides the auditor with a basic understanding of Cobol while at the same time establishing an insight into computer programming and basic DP terminology. Potential auditors are instructed in the fundamentals of flowcharting, language structure, writing and debugging a program and other testing procedures.

The retrieval course provides the auditor with a working knowledge of the capabilities and general uses of the computer-accessing system, including how to prepare the work sheets and process an audit run using simple re-

trieval techniques.

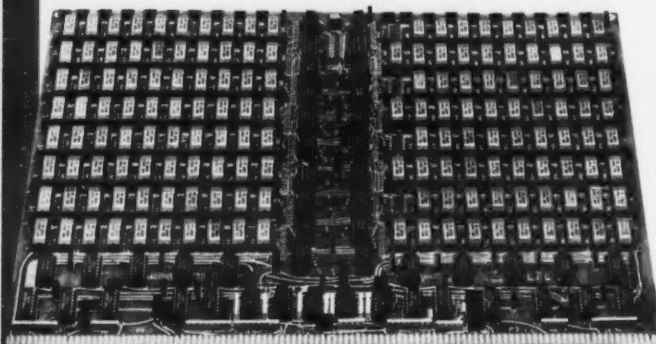
The general objectives of the second five-day course are to explain and define the specifics of retrieval terminology, to explain basic control card (JCL) requirements, define error recovery procedures, demonstrate keypunch conventions and present the logical system flow of the entire operation.

The retrieval course also offers an understanding of the following system capabilities: record extraction based on

parameter values, sequential interval and random selection; surveying item and dollar totals for records; using the system's automatic mathematic features; computational formulas; aging and stratification of records; report writing formats; audit test methods; bypassing control records; and handling nonnumeric data.

Parson is currently the assistant director of EDP audit systems for the Naval Audit Service.

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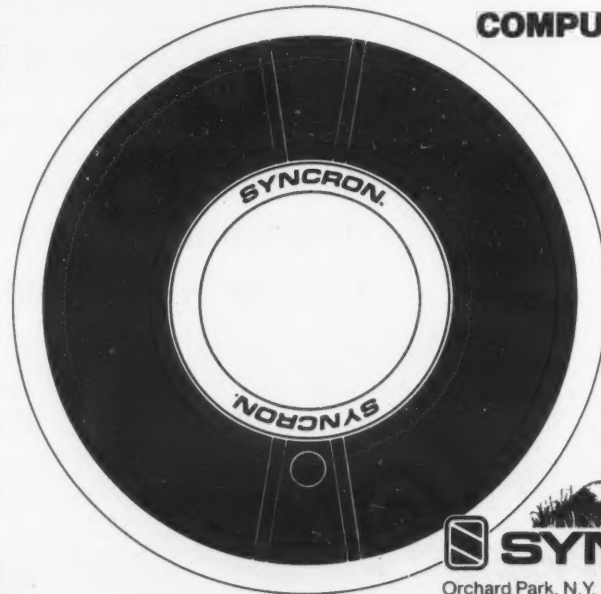
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Energy Department Gets First of Two 3033s

ARGONNE, Ill. — The first of two systems which are expected to nearly triple the computing capacity at the Department of Energy's Argonne National Laboratory is now on-line.

The IBM 3033 processor was recently installed in the laboratory's central computing facility. Coupled with another 3033 processor to be installed next spring, it will supplement the IBM 370/195 and 360/75 which had performed

both batch processing and time-sharing services for Argonne's more than 2,000 computer users.

"Argonne's growing energy research and development programs depend more and more on either computer modeling and analysis or computer management of a data base," according to Richard J. Royston, director of Argonne's Applied Mathematics Division.

"The shortage of computing

facilities had reached a critical point. The additional capacity should meet our computing needs for the next few years, allowing us to move ahead more rapidly in research on alternative energy options."

This spring, Argonne awarded contracts competitively to IBM and Intel Corp. for the \$10 million addition to the central computing facility. IBM will supply the two 3033s each with 6M bytes of memory and 12 channels. The firm will also provide a Model 3800 laser page printer, eight new high-speed tape drives and other input/output equipment to support the four-computer complex.

Intel will supply 63 disk drives, which will have a total storage capacity of 13,560M bytes, and their associated control units.

When the expansion is completed, the additional storage

disks will increase the amount of directly accessible data almost three times, from 5,900M bytes to 19,460M bytes.

The two new processors are dubbed the front-end processor and the numerical processor. The front-end machine, which began initial user tests July 10, will be the system's "scheduler and dispatcher," scheduling programs to run on one of the four computers and directing the output to a printer or a remote terminal.

The front-end processor also will do batch processing and will accommodate part of the time-sharing system, now operated by the 360/75, to allow more users simultaneous access to the computer from remote terminals.

The numerical processor, which is scheduled to be installed next spring, will be used primarily for large-scale

scientific batch processing. It will be controlled by the front-end processor and will be its primary backup.

In addition to the new equipment, some of the laboratory's existing computer equipment, including disk and tape systems, is being upgraded. The number of telephone lines into the system is being increased and the telecommunications device that controls them is being upgraded to enable it to communicate with time-sharing systems running on two different computers.

Argonne, one of the Department of Energy's major energy research and development centers, is operated by the University of Chicago under a tripartite contract among the Department of Energy, the University of Chicago and the Argonne Universities Association.

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System Helping Energy Research

(Continued from Page 55)

A few years ago, he began to explore the possibility of building a new type of specialized computer which might do the job faster and cheaper and turned to Glen J. Culler, a computer designer with Culler-Harrison, Inc. (CHI) of Santa Barbara.

Startling Innovations

Recently completed and installed at the UCLA physics department, the CHI computer has startled even its designers. "Culler's innovations represent a fundamental change in computer design as it has existed since John Von Neumann developed the modern computer," Dawson said.

For its specific task, which calls for processing a massive number of the same kind of calculations over and over again, CHI outperforms two of the most powerful general-purpose computers now on the market.

It is five times as fast as the IBM 360/91 and slightly faster than the Control Data Corp. CDC 7600, Dawson said, and can handle a given amount of data at about one-hundredth the charges that would be run up on the larger computers.

Parallel Processing

CHI was built under a \$325,000 grant from the U.S. Department of Energy, and the key to its speed and low cost lies in its parallel processing design.

Electronic DP, Dawson explained, requires two major functions. One consists of doing the assigned calculations and the other in keeping track of the program by assigning where the answers are to be

stored, where to get the next item of information and so forth.

CHI is not suitable for the large variety of different functions required of commercial computers, but it can be easily adapted to other massive sci-

entific projects. Dawson cited such challenges as modeling the global atmosphere to facilitate long-range weather forecasting, atmosphere-ocean interactions, the dynamics of galactic movements and chemical reactions.

IBM 3032-4

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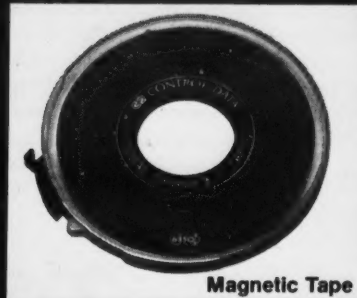


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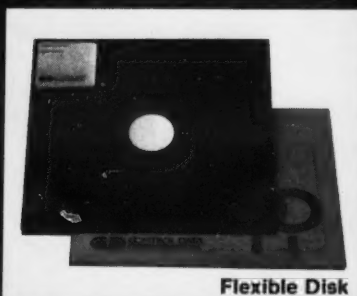
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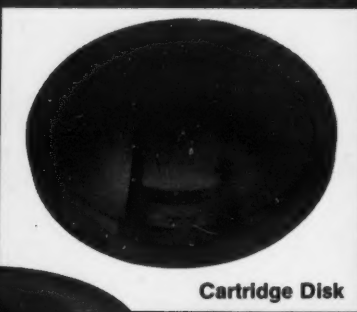
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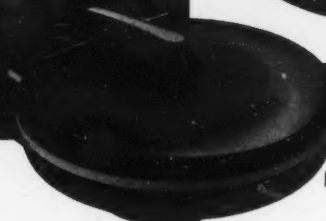
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More than a computer company

Service Firm Boosts Data Entry Performance

(Continued from Page 55) morning from the insurance carriers, at an average rate of 800/week. The keypunch system was double-batch, i.e., claims were processed on a Monday-through-Thursday cycle and on a Tuesday-through-Friday cycle.

Each of 30 employees took home a supply of bills two nights a week in order to manually code the items from each claim onto forms. The follow-

ing day the codes were keypunched from the forms onto cards.

"We began with one keypunch operator who worked 12 hours a day," according to Dottie Patterson, secretary-treasurer and office manager. "As volume increased, we were forced to add another operator."

"It was a DP nightmare," Taylor said. "The first coding cycle would take place on

Monday and on Tuesday night keypunched cards would go into an IBM 360 at a local time-sharing service.

"The service would generate a listing that arrived at our office on Wednesday. Corrections would be made and the entire input was returned to the 360 on Thursday. We did all the editing ourselves," he said.

On Friday the corrections were input, and a modeling

program that simulated the billing environment (adhering to the thousands of relative study report rules and medical services) generated the bills. The bills were then returned to Medata where they were given final review and mailed to the carrier.

"We'd be processing a typical claim from cards three times during the week ... provided we didn't have an error in it, in which case it prob-

ably went in six times!" Taylor said.

"With the keypunch system, we were suffering with a 10% to 15% internal error rate on the key cards alone," Vice President marketing and public relations vice-president Jim Casterline added.

Smooth-Flowing Operation

Acquisition of the System 440 has made Medata's entire operation cyclic instead of smooth-flowing.

As incoming mail is received, claims are separated, coded and filed according to insurance office. A supervisor schedules the day's work, which is then sorted by terminal, with billing information entered by operators at each of the seven data entry stations. Input includes insurance carrier, patient's name, case number and all medical procedures performed (which are numerically coded).

All data is then collected on tape in less than 10 minutes and hand-carried to the 360 at a local time-sharing service.

The 360 processes the data and generates an output tape. This is returned to Medata, installed on the 440 and the bills printed in "unattended mode." Typically the printer is set up at 9 p.m. and is unattended through the night. In the morning, the bills are tear-separated and inserted into appropriate office folders.

In the final phase of the operation, output is checked visually, bills and claims are stapled, special control sheets for monitoring the work are filed and the final product is sent to the mail room for distribution to the carrier.

With the keypunch system, the largest volume of bills that could be processed was 1,000/week, with a high and uncontrollable error rate of 15% to 20%. Although these errors were eventually caught before the bills were sent, the time involved in quality control was expensive.

The present system can process 10,000 claims a week, with an associated error rate of less than .5%.

Dollar savings are equally impressive. A \$3,000/mo time-sharing service expense and a \$2,000/mo keypunching service expense have been completely eliminated. "The small \$150/week fee we presently pay the time-sharing service for running our modeling program can also be eliminated, if we ever decide to reprogram it for the 440," Taylor said.

Costs are also cut for Medata's clients. "Our number one carrier, which is the largest private carrier in the state of California, has saved over \$500,000 last year as a direct result of our services," Casterline claimed.

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Exec Warns Mini Users: Beware Ills of Hardware Contamination

By Edward Paley
Special to CW

HILLSDALE, N.J. — Unlike the sophisticated DP centers installed in "controlled" environments, minicomputer sites are a fertile atmosphere for the accumulation of harmful contaminants. Minicomputer rooms, typical of the small business operation, can be "controlled" in terms of personnel comforts, convenience of operation and aesthetic appeal, but in all likelihood it is hardly a "controlled" environment in terms of the critical needs of computer hardware.

Minicomputer units are installed in spaces designated as computer rooms, but in actuality the potential site can include anything from alcove areas, storage space, the office library or a room where either business machines are stored or in operation. Worse, minicomputers are frequently in heavily trafficked areas where there is a constant flow of unauthorized personnel.

People carry cigarettes and food into and through these areas, or deposit paperwork and personal

belongings on available surfaces.

Air conditioning and filtering units distribute the same air in the computer room that is circulated throughout the entire building. Thus, migration of dust and other contaminants from the general environment to the critical systems is inevitable.

Rooms are often carpeted. Janitorial cleaning, vacuuming, waste removal and exterior wiping of peripherals might meet the level of cleanliness for general office maintenance, but that is

hardly adequate for the performance of sophisticated hardware.

Contamination can be described as any material substance or energy that is unwanted or adversely affects hardware performance. Contaminants that are plainly visible are probably caused by inadequate housekeeping or operator neglect. But more often, contaminants are discovered only through impaired system function.

Man is directly and indirectly the cause of more harmful con-

tamination than any other source. His clothing sheds fibers and lint. He smokes and creates ashes or airborne tar. His hair breaks off. He leaves skin oils on whatever he touches. His skin flakes and scales.

Most types of human-caused contamination are particulate. Their effect is abrasive — a fact that makes their presence on disk and magnetic tape a serious matter. Elimination of these contaminants is necessary to improve

(Continued on Page 72)

Cost Savings Said to Await Firms Going From Big to Small Systems

By Paul Tedesco
Special to CW

Developing a system with minicomputers can prove a cost saving solution for both large and small corporations. A large health care corporation, for example, promises to save more than \$560,000 in personnel costs by developing a portion of its

system with minicomputers.

In fact, the cost of replacing a large-scale system with a minicomputer configuration will roughly equal the cost of maintaining the large equipment.

Thus, by replacing its current system, the health care company stands to cut its maintenance overhead. In addition, the organization's user department will reduce its clerical staff and the firm can expand while continuing to trim its costs.

Much of the company's potential savings will stem from minicomputerizing its claims data entry and validation (See Figure 1). The large-scale system now performing those jobs required more than two years to install.

Its minicomputer replacement, by contrast, will take about a quarter of that time to install.

With the current system, the company validates about 20 types of health care claims,

which on the average require about 600 characters of information. The claims include those submitted by hospitals, doctors, insurance holders and agents.

Other input records were used to correct invalid claims and histories and to change customer status. The original development cost is typical for a system of this complexity. The difference in costs comes from the tools available with some minicomputers.

Greater Than Cobol

Among these tools are types of software that far surpass the capabilities of standard languages like Cobol or Fortran. For example, some minicomputer systems have software features that are intended to simplify system development and installations. These features include:

- Check-off editing languages.
- Simplified CRT screen handling.

(Continued on Page 78)

Software, Hardware Called Equal as Selection Factors

The following story is the second in a two-part series dealing with the problems of minicomputer systems procurement. The first installment, which appeared last week, covered the hardware side of the selection process.

By Terry L. Reid
Special to CW

After the evaluation and selection of the appropriate hardware, you should be ready to select your programming source. The question of who is going to furnish the necessary programming is as important as the selection of the hardware.

There are two basic options available to the user in obtaining programs. The first is to hire your own full-or part-time programmer, and the second is to enter into a contract with an outside source.

In most cases, an outside programming source will enter into a

contract with you to either custom-write a set of defined tasks for a fee or to supply an existing set of programs with the necessary modifications. The contract should include the checkpoints to be used, any penalties for nonperformance by either party and who has the marketing rights on the finished product.

The selection of either an outside programming source or an in-house programmer must be based on the total costs involved to program the systems and maintain them over both the long and short term. The choice must also be based on how well the source can do the tasks.

Remember that even after hardware is installed, changes will be needed throughout the system's life.

To decide which source to use, (Continued on Page 80)

| Old Development Costs | | New Development Costs | |
|--------------------------|------------------|-----------------------|-------------------|
| 4 Analysts | \$369,600 | 4 Analysts | \$ 92,400 |
| 5 Programmers | \$277,200 | 5 Programmers | \$ 92,400 |
| 1 Supervisor | \$103,488 | 1 Supervisor | \$ 25,872 |
| 1/4 Manager | \$ 36,960 | 1/4 Manager | \$ 9,240 |
| Total | \$787,248 | Total | \$219,912 |
| | (Time = 2 years) | | (Time = 1/2 year) |
| Savings \$567,336 | | | |

Figure 1. At a large health care corporation, development costs for a large-scale system would far exceed those for a minicomputer system.

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Exec Warns Users of Hardware Contamination

(Continued from Page 71)

cleanliness in computer areas.

Industrial processes in the immediate or neighboring environment are another source of contamination and they generate not only particulate but film contaminants as well. Casting, machining, milling, plating or welding and soldering performed in the assembly stage of manufacturing produce harmful contaminants.

Film contaminants, such as oxides, chemical residue and various vapors can prevent electrical contact of components and will often change the functional characteristics of mechanical devices.

Dust, another form of particulate contamination, is often attracted from surrounding areas by electrostatic

charges built up by the movement of personnel or generated by systems themselves.

Those are some, but not all, the contaminants that affect sensitive components of a CPU, printer, terminal, tape transport and other minicomputer peripherals.

Critical Surface Areas

Discussion of contaminants and their removal would be incomplete without noting the surface areas that require a high level of cleanliness. The critical components of a minicomputer system include read/write head, capstan, guides, rollers, disk packs, disk cartridges, recording heads, character drums, hammers, electromechanical parts of the printers and CRT terminal

screens.

The results of undetected buildup of contaminants on these surfaces range from signal dropout, noise transients and gibberish to memory loss and costly downtime.

A common problem that can occur from a lack of cleaning and can result in serious repercussions is head crashes. Correctly positioned heads fly at 50 to 300 microin. above the surface of a spinning disk, which rotates at about 2,400 to 3,600 rpm and at 64 to 93 mph.

When dust particles, oxides or ceramic buildup accumulate between a head and disk surface, they act as abrasives and scrap off magnetic material.

If the buildup is great enough, the

head comes in contact with the contamination, disturbs the aerodynamics and causes the head to bounce over the obstacle in its path. The head then touches down and smashes into the surface of the disk to cause data loss.

Often the head crash destroys not only the disk but the head as well.

Preventive Maintenance

Periodic cleaning of tape units is a necessary part of preventive maintenance. Dust, dirt and wear can prevent the necessary contact between the oxide surface of a tape and a read/write head.

Signal strength can be sharply reduced, or recorded information can be completely obliterated. Any condition that causes the tape to be lifted as little as .001 in. from the read/write head will cause the signal to fall below the sensitivity level.

The consequence of electrostatic buildup in the computer room can be as damaging to sensitive electronic components as other forms of contamination. The motion of approaching a data entry terminal across a rug can generate up to 30,000 V on an operator's clothing or skin. As little as 400 V can damage transistors and logic circuits, and 1,700 V can shock a system out of parity.

Static electricity is created whenever there is friction or contact/separation between two nonconductive substances. Steps should be taken to reduce its generation or to eliminate it.

Contamination is a continuous process. To compensate for its accumulation and retention in an environment that is not controlled or specifically engineered for system performance, a regular program of in-house preventive maintenance should be instituted.

Cleaning accessories that are recommended for a contamination-control program at a minicomputer site include wipers, solvents, swabs, micro dusters, presaturated pads and disk pack/cartridge cleaners.

Wipers used in cleaning peripheral equipment such as tape transports, disk drives, terminals and line printers must be lint-free and noncontaminating. These cloths should contain no binders, fillers or additives to affect the cleaning materials or the surface being cleaned.

Cleaning agents should be carefully selected. A variety of solutions, basically detergents, regardless of costs or claims, will leave residue.

A safe, selective solvent that leaves little or no residue and has no adverse effects on materials of construction belongs in computer rooms. Freon 113 blended with isopropyl alcohol is recommended for this purpose.

Urethane foam-covered swabs are recommended for cleaning small, critical components such as recording heads and tape guides. A foam covering prevents the swab from leaving lint fibers on critical areas.

Do not, under any circumstances, use an uncovered cotton swab of the consumer variety. Remember, cleaning areas with inappropriate tools and materials produces contamination and can do more harm than not cleaning.

A compressed gas dusting device is the best method for cleaning remote or inaccessible areas.

Paley is president of Texwipe Co. in Hillsdale, N.J.

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Pays for Self in One Year

Mini Proves Answer to Diocese's DP Prayers

By William J. Brown

Special to CW

ROCHESTER, N.Y. — Purchase a \$85,000 business system and require it to pay for itself in the first year? It sounds impossible, but this was the stipulation of the Catholic Diocese of Rochester when it gave the green light to install a small business system just one year ago.

Despite this shaky mandate, the system did achieve its goal while offering services at a cost well below that of the service bureaus the Diocese previously used.

Since the system's installation, payroll, general ledger and mailing applications have been successfully trans-

ferred to the system. In addition, the Office of Pastoral Planning has implemented a parish pastoral/sacramental information system, Catholic elementary teacher data base and an historical statistical information system charting births, deaths, marriages, school population and registered Catholics as well as various other services.

Built around a 64K-byte Qantel Corp. 1400 CPU, the system incorporates a 75M-byte fixed disk unit, 1,600 bit/in. tape unit, 333 line/min printer and three CRT terminals. The system also uses Qic Basic, a version of Dartmouth Basic.

The operation is aided by two utilities — a report generator and program gen-

erator.

Even with a DP staff of only three members, the system has proven a strong tool. Downtime has occurred less than 10 times in 12 months of operation. In all cases, the problems were corrected without delay or loss of schedule deadlines.

The software has saved hours of programming time and at the same time produced detailed information reports in minutes.

Information-Gathering Package

During the system's implementation, the planning office's goal was to provide technology for the solution of parish problems. Identifying parish

populations was a central problem because most parish information was outdated or incomplete.

In response, the planning office created an information-gathering package. The report generator (a system file report utility) identifies targets of parish and special ministries like shut-ins, students, nonchurchgoers and the elderly as well as those willing to share an expertise with the parish community. Any of these reports can now be created in minutes.

Each parish in the Diocese has different problems, different ethnic and socioeconomic backgrounds and different needs. Therefore, flexibility had to be built into the pastoral/sacramental information package programs or they would not truly meet the needs of the parish.

Three file modules form the base for the parish data system. The main module is the biographical file listing family name, address and basic statistics on the residence. The other two files — one for the individual and the other for time and talent — are linked back to the biographical file by a common key.

The individual file provides personal information such as marital status, age, sacramental status and job status, while the time and talent file lists the abilities an individual has offered to the parish community such as carpentry, plumbing, ushering, maintenance, visiting the sick and singing.

This file layout reduces filing space and enables the user to take advantage of the report generator's strongest attributes. Using the generator's conversational techniques, the system lists all those of a particular age group (individual file), where they live (biographical file) and what talents they offered to the parish (time and talent file).

The Diocese's Office of Education is another of the system's users. Several times a month, the office receives requests for school population statistics regarding various subgroups.

In the past, these requests forced two secretaries to sort through 75 cards. Now, the information is easily accessible in just about any form or format.

The setup time of any data base has also been reduced with a program generator that aids in the repetitive process of creating file declarations and formats. The software lets a programmer/analyst create in days what would take months with many other systems.

In the first year of operation, the office has completed seven parish information programs.

Stone to Space Age

The installation here is unusual in that the Qantel configuration, usually a turnkey business system, is being used by the planning office for everything from payroll to school population projections. In the last 12 months, the Diocese of Rochester has moved from Stone Age to Space Age DP technology. The parish pastoral/sacramental information package has been praised by parish staffs as the third book of the bible and the diocese's overall information base has increased tenfold.

Brown is controller of DP at the Catholic Diocese of Rochester, N.Y.

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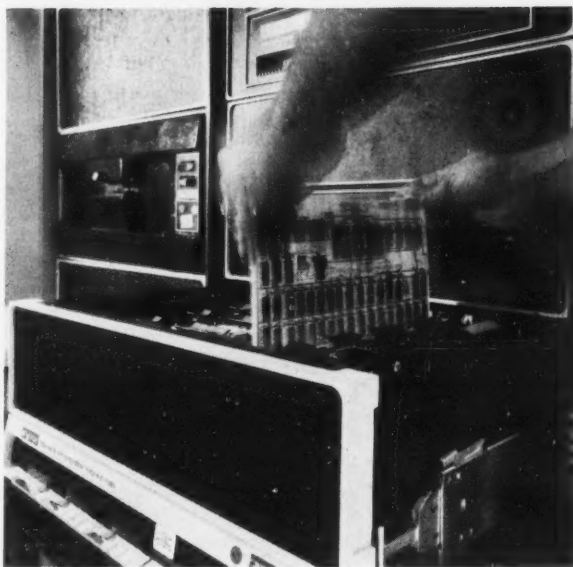
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Small System Fills Dental School's Test Needs

Special to CW

BIRMINGHAM, Ala. — An interactive minicomputer system is playing a major role at the University of Alabama School of Dentistry, where it is being used to test filling materials, analyze dental needs in Iraq and develop new techniques to rehabilitate oral and facial deformities.

The system also maintains patient and student records, instructs students, schedules students in clinics and scores tests.

According to Dr. Homer C. Jamison, professor of dentistry and coordinator of the school's computer applications, the system has enabled the School of Dentistry to do about four times more work in half the time and for approximately half the cost of the batch-oriented and time-sharing services it formerly used.

The school has used the system to improve educational programs that help students obtain better academic and research training in all eight specialties of dentistry. The end result, Jamison said, is more effective dentists.

Conflict With Central Facility

The University of Alabama School of Dentistry began to automate its records with a computer 16 years ago by using the central facility that served the entire university. But the system posed many problems for the school.

"We could barely keep our heads above water," Jamison recalled. "It seemed that we were forever programming and reprogramming to accommodate the central facility and its software. Computing resources were limited and the cost was high. In trying to meet the needs of the entire university, the central facility was not meeting the needs of the School of Dentistry satisfactorily."

In addition, procedures proved cumbersome in batch mode. To assign students to clinics properly, the school had to run programs repeatedly — a procedure that took several days, Jamison said. Now, with an interactive system, the school can perform the same procedure in two hours.

"It was also hard to update files and prepare reports with the old system," he added. "Because we continually add new lines of code to programs, change class and clinic schedules and have fluctuating enrollments, we must have a system to update files easily. We needed a dynamic system designed and implemented for flexibility, one that would handle changes quickly."

Smooth Switchover

So two years ago, the school decided to purchase an in-house, interactive system. "It had to be able to support programs larger than its physical memory and to be a multiuser system that could meet the needs of our many dedicated end users," Jamison explained.

After investigating numerous vendors, the school selected a 192K-byte Prime Computer, Inc. Model 400 CPU with 300M bytes of disk storage, eight CRT terminals, a tape drive system, 430 line/min printer, three 30 char./sec typewriters, a teletypewriter and a forms reader. Jamison and his colleagues chose the configuration over rival systems because it can support up to 63 simultaneous users and accom-

modate files up to 30M bytes long, he said.

Conversion from the central computer to the Prime system went smoothly, according to Jamison, primarily because both systems use Fortran — a fact that made program transfer easy. Within a few weeks, the school ran all of its former file maintenance applications and was adding programs.

Research Aid

Research and research training are fundamental to the School of Dentistry, and the minicomputer system has been used in several dental research areas. At the Maxillofacial Prosthetics Treatment and Training Center, students have used the system

to develop technical procedures to help rehabilitate patients with oral and facial deformities.

The students in the school's special patient care program have also used the system to develop reports that summarize oral health care given handicapped persons in clinics. Predoctoral and postdoctoral candidates have used the system for research and training applications in biochemistry and oral biology.

In addition, the school is also using the system to test today's tooth-matching filling materials.

In the late 1940s, a plastic-based filling material replaced the synthetic porcelain that had been used to fill front teeth for 40 years. A third generation of filling material, an improved plastic,

was developed in the early '60s.

This plastic, widely used today throughout the world, poses several aesthetic and economic problems. Although the plastic is colored to match front teeth, it sometimes discolors at the edges of teeth and wears away after prolonged chewing and brushing. And when the plastic sets in a tooth, it shrinks to create a loose fit.

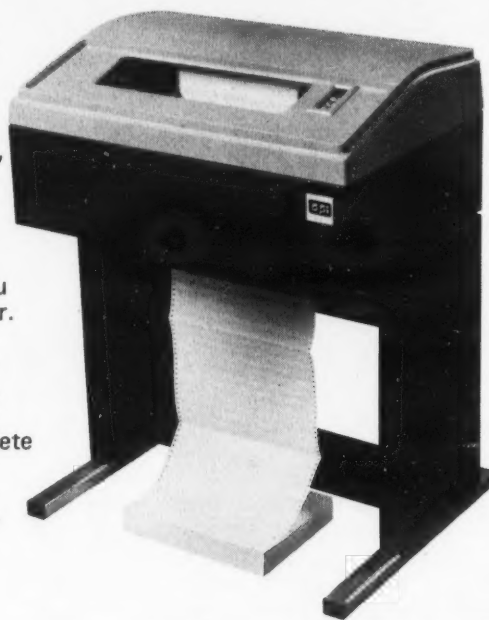
When the biting edges of front teeth need filling, an unattractive gold shell must often be inserted to provide added strength to reinforce the plastic. Not only unappealing, the procedure is also expensive.

The Alabama School of Dentistry is using the minicomputer system to analyze various plastic materials to determine (Continued on Page 79)

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Research Firm Concludes Systems Factors Should Rule Supermini Choice

By John Callahan
Special to CW

WALTHAM, Mass. — Choosing a supermini is often referred to as hardware selection but more accurately it is the selection of a system and a vendor.

Rather than evaluating only hardware capabilities, supermini users are concentrating on total system capabilities — which are often more dependent on software subtleties than pure hardware muscle, research conducted by International Data Corp. (IDC) suggests.

Other factors that users evaluate are the capabilities and reputation of the vendor for providing adequate maintenance

service and software support after the system is installed.

Two system characteristics that are receiving increasing emphasis as evaluative criteria are reliability and ease of use. In any system, these attributes are dependent on both hardware and software.

Reliability is particularly important for on-line and real-time applications such as electronic funds transfer systems or laboratory monitoring.

Ease of use becomes critical when most of the system's users are not trained or experienced in DP such as in many in-house time-sharing applications.

Check with users who are currently performing the applications you require on the systems you are considering. Your effort will pay off by providing valuable data for evaluating reliability and ease of use.

Hardware Considerations

Obviously the initial configuration must be able to perform the appropriate applications within the price/performance parameters established. But this step is only the beginning.

IDC's research among supermini users has shown that system growth is not only probable, it is practically inevitable. The odds are that within 12 to 18 months after the initial acquisition of your supermini systems you will make one or more of the following system upgrades: add more main memory; add more disk storage; upgrade to a faster printer or add a second printer; add more terminals.

The necessity of these upgrades stems from two factors that are seldom controllable. The first is that endearing human quality called optimism. Or stated in terms of Murphy's Law, the initial applications will probably require more resources than you anticipated.

Secondly, the odds are that you will add new applications within 12 to 18 months of acquiring the system and, in at least half of the cases, these new applications will require some form of system upgrade.

What this means is that unless you can see a clear upgrade path within the system from the beginning, you may encounter capacity constraints even before all of the initial applications are up and running. In view of others' experiences, it makes a great deal more sense to acquire the minimum configuration of a larger system than the largest configuration of a smaller system.

It is also wise to look beyond the system under consideration to the up-

grade path to the next model. Is the system field-upgradable to the next larger system? Will migration to another model require extensive reprogramming? Is there a next model?

A range of peripherals is crucial for orderly system growth. Fortunately, both systems suppliers and independent vendors offer a wide selection of peripherals for most popular superminis.

Independent vendors could offer peripheral options not available from systems vendors and often offer better price/performance. Because peripherals will probably represent the majority of a system's cost, they deserve careful consideration. Are removable disk packs required for your applications? Are they available from the system supplier or an independent vendor? Will the system support the specialized peripherals you require, such as plotters? Can you use the same peripherals if you upgrade the processor?

If the answer to that last question is "no," it can increase the cost of a processor upgrade by three- or fourfold.

Software Considerations

Software-related selection criteria are most frequently mentioned by users as the critical factors in system selection. Is the operating system appropriate for your applications? While you get some indication from the vendor's documentation, benchmarking several systems, if possible, under "typical" workloads can provide the best measure of software performance.

If you can't structure an appropriate benchmark test, talk with other users of the systems you are considering to determine the systems' performance under the conditions you anticipate. Are the operating systems stable? Other users will tell if they're not — if you ask.

One major operating system constraint encountered by many supermini users IDC has interviewed is the maximum amount of addressable memory that is allocated to any time-sharing user. For research and engineering applications, the memory allocation is often inadequate.

An important software consideration is the programming languages available with a system. Many superminis now offer several high-level languages. Fortran, Basic and Cobol are the most popular.

Having the high-level language that is most appropriate for the majority of your applications can make life much easier. Programmer retraining may be unnecessary or, at least, can be minimized.

Because a supermini is likely to be used for various applications, it is convenient to have more than one programming language.

For many on-line applications a data base management system (DBMS) is highly desirable. Is a DBMS available on the system you're considering? Is it easy to use? Is it adequate for your proposed applications? Is it easy to produce *ad hoc* reports? How do current users evaluate the DBMS? Do they find it satisfactory under conditions similar to those you anticipate?


The availability of applications software can also be a factor in system selection.

(Continued on Page 77)

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Hardware Just One Facet of Supermini Choice

(Continued from Page 76)

lection. If appropriate applications packages can be purchased, substantial in-house programming costs can be avoided.

In some cases, IDC has found the availability of a software package to be the determining factor in system selection. In these cases, users found an applications software package they wanted to implement and then bought the supermini system that ran the software package.

As in-house software development

costs continue to increase, the availability of applications software can be expected to become a more important factor in selecting a supermini system.

Service Quality Varies

Maintenance is an area that always provokes much comment. While the quality of maintenance can vary from vendor to vendor, the quality of service can also vary widely for the same vendor in different geographic areas.

The best way to get an indication of the quality of service to expect is to

talk with users for each vendor you are considering in the service area where your system will be located. Some questions you might want to ask each vendor include: Where is the closest service office? What diagnostics are part of the system? Are there remote diagnostic capabilities? Where is the nearest parts depot? What is the "typical" response time for a service call?

If you have peripherals from several vendors, you might want to consider the alternative of third-party maintenance. This alternative provides

single-vendor responsibility for all maintenance and can avoid "chronic finger pointing."

Software support generates the greatest degree of user dissatisfaction, but even in this area, most vendors are satisfying most of the users most of the time. Nevertheless, software support is the vendor area most in need of improvement.

Freelance researcher/consultant John Callahan directs special projects for International Data Corp. of Waltham, Mass.

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| FUNCTION | LARGE COMPUTER | MINICOMPUTER |
|-----------------------------------|---------------------------------------|--|
| On-line input | Hand-coded with aid of CICS | Supplied in minicomputer software |
| Design of CRT screen for input | Hand-coded with aid of CICS | Use checkoff sheet or answer questions on-line |
| Error checks for Alpha or Numeric | Hand-coded in Cobol | Checkoff sheet |
| Range validation | Hand-coded in Cobol | Supply ranges on checkoff sheet |
| Table lookup | Hand-coded in Cobol | Name the table |
| Verify data base | Data base language (IMS, IDMS, Total) | Use a Cobol-like language |

Figure 2. Wide differences in coding functions separate large-scale systems from minicomputers.

Switch to Small Systems Seen Route to Cost Savings

(Continued from Page 71)

dling.

- Simple data-base structures.
- Simplified program coding.
- Extended Ansi Cobol and Cobol-like languages.
- Easy debugging techniques.

These are only a few of the minicomputer software features that reduce system installation time. This software is supplied either by hardware manufacturers' or by software houses that deal primarily with one type of machine.

The types of software available vary considerably. An advantage to one corporation will be a disadvantage to another. Each system has a unique

method of supplying cost-saving functions.

With one system you can create an added transaction, and the system will create identical transactions for change, inquire, delete, get the next data-base record and get the preceding data-base record.

Answer a list of questions, and the system creates a specific transaction with error correction, management statistics, security, verification and data base creation. The variations are innumerable.

With a standard business language like Cobol, users would spend weeks coding these functions. In fact, in many cases Cobol would not support their requirements. Moreover, wide differences in coding functions separate large-scale computers and minicomputers (See Figure 2).

Development Scenario

The scenario for any system begins when users determine they need a system. With a large-scale system, an analyst investigates the user department functions, which are then translated into a set of specifications.

A programmer then writes programs from these specifications. In the end, the system seldom meets the disappointed user's requirements. This process takes a long time.

With a minicomputer system, a program is constructed and demonstrated to the user, who is forced to participate and usually finds discrepancies between the developer's understanding and his own requirements. Step by step, the system is corrected until it is ready for production. In the end, the system will have been installed in weeks, not months.

Minicomputer Applications

Large companies have used minicomputers to do stand-alone jobs, form distributed processing networks, and perform remote job entry. These applications are standard in DP literature.

However, one large city is using a minicomputer as a front and back end of a payroll system — an arrangement that will allow timekeepers to complete their existing payroll forms and at the same time receive the benefits of a new system without massive retraining.

So minicomputers are now becoming a buffer for people and not just a distributed processing network.

Some small businesses do not have the capital to refinance a new system development with large-scale equipment.

New high-level software is making it possible for these corporations to move their systems from antiquated large equipment to new low-cost mini equipment.

Because of the new software's ease of use and low system development costs, we will see the expansion of minicomputer service bureaus into small neighborhood stores, small manufacturing plants, sales and service industries, small cities and other areas that cannot currently afford to support a systems development.

If the software works for large corporations, it will work even better for small corporations.

Paul Tedesco is executive vice-president of CTK Enterprises, Inc.

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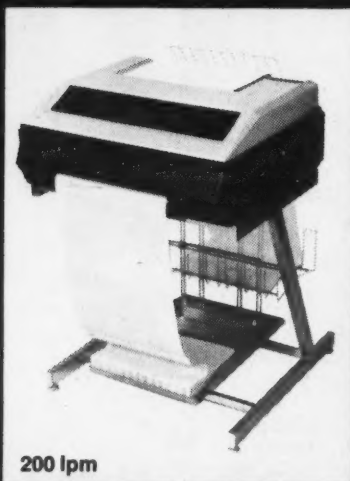
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Mini Aids Dental School Studies

(Continued from Page 75)
mine the best plastic composition that will withstand wear, discoloration and shrinkage.

Using a machine that simulates brushing, the school is able to analyze abrasion data. The machine brushes the plastic material and teeth filled with the different plastics for six consecutive hours — the equivalent of 30 years of brushing.

The same machine is also modified to simulate a striking, chewing action that is repeated for five straight hours — some 20 years of chewing. The teeth are weighed after each test to determine weight loss. The data is then analyzed using the Prime system.

"Although these plastics are widely used today, we know very little about them," Jamison said. "The goal of our research effort is to determine which of today's plastics are the best — and for what reasons — so that someday an improved plastic filling material may be developed."

"We hope that an improved 'fourth-generation' filling substance could someday help people look better, save money and prevent the inconvenience of replacing fillings that wear out. The results of this research effort will be important in the selection of materials and compounds of new materials that accomplish these benefits," Jamison added.

Analyzing Iraq's Needs

The school is also using the system to analyze the dental needs of Iraq.

Modern dentistry is relatively new in Iraq, with only one dental school for more than 12 million people. Last year, the University of Baghdad asked the school to help investigate oral health and normal dental hygiene routines by surveying a sample of the population of Iraq.

The minicomputer system here is analyzing the survey results, which will define the state of dentistry in the country and tell the Iraqi government how to better serve its population now and in the future.

Another new application made possible by the system is computer-assisted instruction.

Using dedicated CRT terminals, the school has developed a drill and review instruction exercise that lets students test their knowledge in an interactive environment. Stored in the system are more than 2,000 questions and answers formerly used by the National Board of Dental Examiners. More than 200 additional microbiology questions and answers also are stored in memory.

Case simulations, theoretical diagnoses and treatment pro-

cedures will also be developed to supplement textbook education with an interactive learning experience, Jamison said. A planned computer graphics system will help students better visualize dental concepts and illustrate oral surgery — right in the classroom over closed-circuit TV.

Clinic Data Maintained

As a service to the community and for "hands-on" training experience, School of

Dentistry students maintain oral diagnosis clinics and perform oral surgery. More than 25,000 patients are involved in the clinics that provide dental care in 15 specialty areas, including treatment of gum disease, correction of abnormally aligned teeth, denture treatment and dentistry for children.

The large volume of patients involved in clinical programs make automated recordkeeping a "must."

Printwheel Line Serves Seven Language Classes

HAYWARD, Calif. — Thirteen additional printwheels, all for European language applications, have joined Qume Corp.'s line of printing mechanisms for the company's daisywheel printers and terminals.

The printwheels provide six pica 10 pitch and seven prestige elite 12 pitch in seven languages classifications, according to a Qume spokesman. Those classifications include Sweden/Finland, Denmark/Norway, France, Switzerland, Italy, The Netherlands and Spain.

The printwheels cost \$14.75 with OEM discounts available from Qume at 2323 Industrial Pkwy. West, Hayward, Calif. 94545.



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Software, Hardware Seen Equal in Selection

(Continued from Page 71)

you must look at all the factors involved and base your selection on the best option for your company. Time spent on the selection of the programming source is not wasted, as the best hardware available cannot cover mistakes made in this phase.

Set Standards

Consider all the facts before you decide on your programming source. A set of standards should be developed to be used in the study of each source.

Request and research the experience of all sources in your type of business operations. Just as there are specialists in other fields, there are specialists in DP. You would usually not want to give a banking application to a source

whose experience is totally in engineering.

Expect any source to furnish you with its past accomplishments, its basic area of experience and references as to where and for whom it has done similar work. Don't be lazy. Fully check out the references and dig deep into the prospective source's statements.

Find out if its past employers were pleased with its work and if it was able to meet the required delivery schedules. Now is the time to get the answer on how reliable the source is.

Be sure to check on all references. Do not stop at one or two, and do not talk just to the project manager. Get in touch with the operators who use the system, any other programmers on the

staff and, if possible, the end user of the system's data.

You should also begin to estimate the cost your sources will ask to do your work. Be able to justify these costs just as you would for any other service you use.

Always remember that the days of the "Magic Box" concept of the computer are over. All parts of a computer installation must be cost-justifiable, but be realistic, as the finished installation can be no better than its hardware and supportive service skills and will never be able to perform anything that it has not been designed to do.

Also keep in mind that when you make changes to a project or the priorities of a series of projects, you will be increasing its cost from the out-

side source. When the source bids on a job, it is on a defined project or list of projects.

When you change the projects, you will pay for the resulting increase in work.

This is not to say that if you have an in-house programmer the cost of a project will not increase when you make changes. The cost will increase, but it will usually not be as great an increase as when you make changes with an outside source.

The reason is that the in-house programmer is your employee, and all that is involved to make a change is his increased time and extra machine time.

With an outside source, you are paying for its worker's increased time plus the profit the source wishes to maintain for the job. Whichever source you use, changes cost money.

Both sources will require time on your computer. You must pay for the time you use on the computer, and you must also add the increased time used for the project. If you conduct the selection process right, both sources should require about the same amount of time on the machine.

Whichever source you use for programming, require delivery schedules for every project and monitor them throughout the project's life. Establish checkpoints for the project, and never allow changes to the schedules without valid reasons.

You would not allow any other vendor or internal department to make changes in a delivery schedule without acceptable reasons. A programming project is like any other service you buy, no matter what source you use.

Another point to keep in mind is not to expect miracles. You wouldn't give a project that you knew would take two weeks to any other vendor and expect it done in one week without expecting to pay more for it. Do not expect extra service from a programming source without being willing to pay an extra cost.

Sticking to Schedule

Do not expect your programming source to police itself when it comes to maintaining delivery schedules. It is your job to make sure a project stays on schedule. Do not get lazy at this point, or you will see delivery time balloon and costs grow.

In some cases, you will be able to turn the management of the project over to the source you are using. If you do, be sure to keep control of the project with someone you can trust to keep the best interests of your company in mind at all times.

Have someone to manage a project in the development, installation and throughout the life of the finished systems. Even if the programs have been installed, do not assume they meet the original specifications.

Always check every project after completion to be sure it meets your specifications and is producing correct data.

If you use an outside source and errors are found in a project, be sure to determine if the errors were your fault or the source's and don't pay an extra fee to correct errors your company did not create.

Terry Reid is purchasing agent and programming manager of the Urbana, Ill.-based Harry Gill Co.

A SMALL ANNOUNCEMENT



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WHEN
YOUR DATA
MUST PLAY
**Specify
Verbatim.**



Youngster checks out Heath H-9 terminal (top) while kids entertain themselves with games on RCA's Cosmac VIP micro system. The activity took place at Personal Computing '78.

Photos by E. Surden

No Micro Now Sold Ready for Business, Zaks Warns Users

By Esther Surden

Special to CW

PHILADELPHIA — "Every microcomputer on the market today has the hardware capability to be a complete business system," but not one actually is, Rodney Zaks of Sybek, an educational publishing company, told a group at Personal Computing '78 here recently.

However, a small business can "still make reasonable use of a microcomputer system in its environment," he said.

Speaking at a session called "Microcomputers for Business: Fraud or Reality?" Zaks noted that microcomputer systems require certain capabilities to be useful for business.

For example, most business applications require the user to keep and access a number of files so a clerk doing order entry can consult an inventory file to see if the goods are in stock.

Also, before an order is proc-

essed, a credit file must be consulted to determine "if the business or person ordering is creditworthy."

Further, if a commission is to be paid, a file on that must be kept and updated. For the order to be shipped, labels must be generated from an additional file.

Programs Not Integrated

"Whenever even a simple transaction is made, you probably update or modify 10 or more files in your system and use five to 10 specialized programs," Zaks told the group. No microcomputer available today can provide all of the necessary applications software in an integrated software package, he noted.

Some microcomputer vendors do offer some of the programs needed to perform business applications, Zaks said, but the programs are not integrated: "You will record sales transactions, but then you must set up a separate manual transaction in order to update the other files and load the other programs."

"Knowing how error prone human transactions are, the odds are that your business will be significantly damaged the day somebody loads the diskette out of order or does not update one of the files," Zaks warned. He reminded his listeners that most microcomputers today require "a lot of human intervention."

Tips on Peripherals

However, for the small business person set on getting a microcomputer for his business, Zaks gave some tips on acquiring the right peripherals. Peripherals are probably the most crucial hardware element in a microcomputer system," he contended.

"They are more important than the microcomputer itself," Zaks maintained, because "the main cost will be peripherals."

The basic microcomputer system will have a CPU, a keyboard, a CRT terminal, a hard-copy

(Continued on Page 82)

Hobby Micro Systems Worth \$600 Seen Unsuitable for Business Use

By Esther Surden

CW Staff

PHILADELPHIA — A \$600 hobby microcomputer system, despite the claims of some hobbyist vendors, cannot "meet the expectations" of even the very small business user.

That was the message delivered by Carl Warren, senior editor of *Interface Age* magazine, at Personal Computing '78 here recently.

A \$600 system, however, is very good for a user who wants to acquaint himself with what computers can do, he said. Anyone considering automating a small business should get an understanding of the capabilities of small systems and buying a very small system to play with is one way to do it, he stated.

Like a large organization, a

small business should first look at what reports are necessary for effective company management and then get a system that can deliver all of those reports.

Users should define their goals precisely. "As a user, you have a responsibility to the industry just as much as the industry has a responsibility to you," Warren admonished.

After a user has defined what he needs, he can begin to see whether a microcomputer will do the job. For example, if a small business person wants to do billing and a computer store advertises a billing application on a system, Warren advised: "Take a statement and walk into the computer store and say 'How many of these can you stuff in there [the system]?' 'Then watch for the answer. The most correct an-

swer is that it depends on how the data will be saved."

If you find out that a microcomputer doesn't meet your needs, you "may have to call Digital Equipment Corp. or Data General Corp. or, God help you, IBM," he said.

"It may take you more time to do your accounting" on a microcomputer than manually because the micro is foreign to the typical small business user and it takes some time for him to learn its technical ins and outs, he said.

Consult With Designer

After having decided to go ahead with a microcomputer system, the user should "sit down with the system designer" and tell that professional what is needed. The system designer

(Continued on Page 82)

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Cross-Assembler Adapted to 6801 and 6802

LAFAYETTE, Ind. — Wintek Corp. has reportedly adapted its 6800 cross-assembler to recognize and support the assembly instructions of Motorola Semiconductor Products, Inc. 6801 and 6802 microprocessors, as well as the instructions incorporated into that firm's 6800 unit.

Version 1.4 can be used as a stand-alone assembler producing absolute object code in Motorola's Mikbug format or in a relocatable mode for use with Wintek's Cross-Linker and PL/W compiler, a spokesman claimed.

By using the relocatable mode, the programmer can assemble the program in "pieces" and develop subroutine libraries which can then be recombined into a single program, he said.

Advanced listing controls including

title, subtitle, date, time, paging, spacing and automatic source program formatting are supplied in the cross-assembler and help improve readability and documentation for later program maintenance, the spokesman related.

Version 1.4 also recognizes all of the standard Motorola operation mnemonics and pseudo-operation codes and produces a sorted symbol table and cross-reference map.

The cross-assembler software is written in Ansi Standard X3.9-1966 For-

tran and can also be used with any computer or minicomputer supporting an Ansi Fortran compiler.

The source program is contained on magnetic tape and costs \$800 from Wintek, 902 N. Ninth St., Lafayette, Ind. 47904.

No Micros Ready Yet for Business Users

(Continued from Page 81)

printer and some mass storage. The keyboard should have a separate keypad with numbers from zero to nine in the same order as they appear on a bookkeeping keyboard so a bookkeeper can use it efficiently, he said. It should also have certain function keys that allow users to "move a cursor up

and down" or perform other functions.

Business users cannot use a standard television set instead of a CRT terminal, Zaks warned. Although some of the hobbyist vendors suggest a standard TV set can be used, it cannot display 24 lines by 80 characters of upper and lower case letters for a variety of

technical reasons.

Another alternative for communication with a micro system is a monitor.

A monitor costs about \$200 because it is designed for continuous heavy-duty use. However, "if you use a monitor, your microcomputer cannot talk to it directly," he cautioned. "You must generate an audio signal, and this requires a special interface board in the microcomputer."

Best Alternative

The standard CRT is by far the best alternative for business use, but it is expensive. A reliable unit, according to Zaks, costs \$800 to \$1,000; anything less expensive is "unreadable" after a few days of use.

Responding to a question from the audience, Zaks said a printing terminal is unsuitable for business use. It cannot be used to flip through files, he explained.

Any microcomputer system needs a printer, he stated, and there are many technologies around from which to choose. But "no ideal printer has been found that anybody can afford."

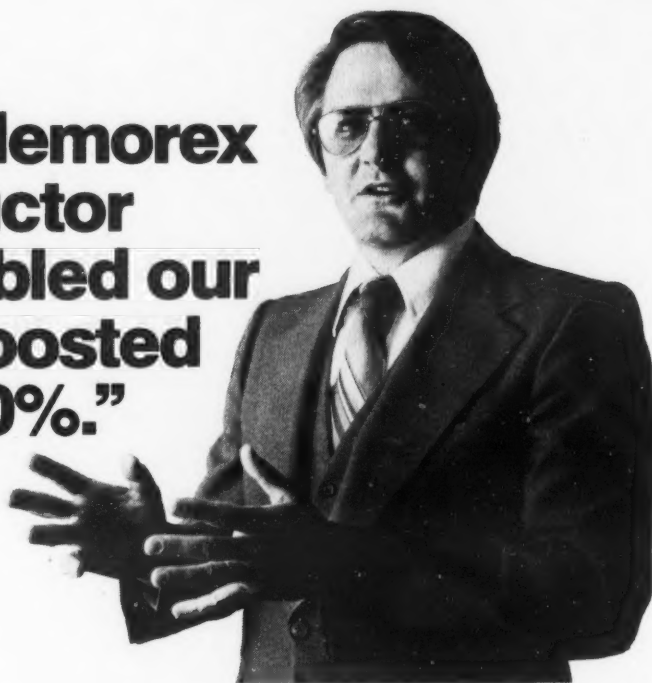
Mass storage is also a necessary part of a system, according to Zaks. The "minifloppy" disk is the "best for personal hobbyists, but not for business use," he said, because it cannot store enough data for reasonably sized files.

The floppy disk is better, but it is too slow and also lacks enough storage space for business applications.

The user is really in a bind if he wants to use disk, Zaks indicated, because the best alternative — hard disk — is not yet priced low enough for the very small business.

"Adding a Memorex 6358 Semiconductor Memory doubled our capacity and boosted throughput by 20%."

— Ron Gossman



Mr. Gossman is Operations Manager for Brown & Williamson Tobacco Corp., the nation's third largest tobacco company. Headquartered in Louisville, Kentucky, the company's data processing facilities include two System/370 mainframes, operating both batch and teleprocessing applications.

"Prior to adding the Memorex memory, our first shift was experiencing long delays in job execution. We realized the problem wasn't with the CPU, but that throughput was blocked by paging. We were exceeding a rate of 20 pages per second. But with the addition of the 6358 Memory System, our paging rate was cut to less than one page per second."

The Memorex® 6358 doubled the main memory capacity of Brown & Williamson's System 370/158 to two megabytes.

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"Two factors swung us to Memorex. First, we already had Memorex 1270 Terminal Control Units and were satisfied with their performance and Memorex service. And second, we felt certain technological features of the Memorex 6358 made it more reliable and functional for us. An additional plus was Memorex's short delivery time.

"The added capacity and reduced paging rate allow jobs to run faster. We can now meet a much greater demand for computer services, such as our new marketing data base.

"The Memorex add-on has done exactly what we expected."

For more information about what Memorex Semiconductor Memories can offer you, see your Memorex Representative, offices in principal cities worldwide, or contact Memorex Semiconductor Memories, San Tomas at Central Expwy, Santa Clara, California 95052, phone (408) 987-1000.

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Hobby Systems Not for Business

(Continued from Page 81)

"has to understand what you want to achieve. He must understand your business," Warren told the group.

No packaged software system is right for all businesses, he warned. The user has to make sure the designer does not just sit down at a terminal and create a package without taking the particular business into consideration.

Software is not the only aspect of a system that must be tailored for each particular business. If the user is "in a dirty business, it becomes important to have a solid piece of equipment" that can survive the environment. Disks often cannot be placed in the back room at a "mom and pop" establishment, he indicated. They are too easily damaged by smoke and dirt.

Those buying microcomputers for business now must also be aware that many of the computer stores do not provide the level of software or maintenance contracts necessary to support a user. This is changing, however, Warren noted, as the industry matures.

DG to Buy Half of NEC

By Marcia Blumenthal
CW Staff

WESTBORO, Mass. — Data General Corp. has agreed in principle to purchase 50% of Nippon Electric Co. (NEC) of Japan and in exchange has granted NEC an exclusive license to manufacture and sell in Japan all of DG's current and future computer products.

The agreement also gives NEC nonexclusive rights to sell DG computer products in 21 Far Eastern countries, including the People's Republic of China, North Korea and South Korea. Until now NEC has sold DG products only in Japan, according to a DG spokesman who added that the new arrangement gives DG access to virtually the entire Far East.

A major feature of the agreement is NEC's exclusive right to manufacture and

sell all of DG's computer products that appear during the next 10 years.

NEC has manufactured and marketed DG equipment for about the past five years. However, the two companies have entered into individual licensing arrangements for specific products.

Growing Business

With its DG-related business growing at 20% to 25% a year, NEC found that licensing arrangement a time-consuming and cumbersome way of doing business.

Consequently, the spokesman said, NEC approached DG seeking a more permanent, long-term agreement which would cover all of DG's computer products not currently licensed.

The companies have been negotiating the terms of the agreement for well over a

year, the spokesman noted, adding that the Japanese Ministry of International Trade and Industry is entirely favorable to the arrangement.

While the Far Eastern markets are small today, they are growing rapidly, the spokesman said, with some of them doubling yearly.

"Far Eastern countries which have trade and industrial activity are just beginning to discover minicomputers," he added. These marketing rights, along with NEC's strong marketing organization, are expected to give DG's products a strong foothold in these growing markets.

The agreement is still subject to review by the U.S. Internal Revenue Service, which DG has asked to examine proposed tax reporting methods connected with the transaction.

Cbema Urges Noninterference Policy Carter Stand on DP Exports Slammed

By Edith Holmes

CW Washington Bureau
WASHINGTON, D.C. — Computer and Business Equipment Manufacturers Association (Cbema) President Vico B. Henriques recently wrote to President Carter denouncing the Administration's intervention in the sale of computer systems abroad.

Sparked by Carter's decision in late July to cancel Univac's sale of an 1100 series system to the Soviet Union's news agency, Tass, Henriques argued that "such intervention has harmed our competitive position in international markets."

The use of normal commercial transactions between U.S. firms and their overseas customers as a foreign policy tool will ultimately "cause serious and irreparable damage to our entire economy and will undermine our national security," the association president said.

Noninterference Urged

Henriques recommended that the Carter Administration adopt a policy of noninterference in day-to-day sales made by U.S. companies to other nations.

Military goods and the technology for their use or manufacture should be exempted from this policy, he added. Similarly, any nonmilitary goods and technology that could significantly enhance the military strength of an adversary country should be scrutinized by the federal government, Henriques stated.

"Except for major actions against specific countries, such as complete boycotts, the conduct of foreign trade in commercial products, services and technology should be separated from foreign political policy," the Cbema president wrote to Carter. "Our long-term national interest is to maximize jobs and exports and to strengthen our economy so as to maintain our national security and our world leadership in science, technology and engineering."

Henriques warned the Administration to assess the full effects of its foreign policy actions, not only on "such ethereal concepts as universal human rights," but also on foreign commercial trade as an important component of the national welfare.

The U.S. leadership role as the chief producer and exporter of high technology products and

services is being seriously challenged by several nations — Japan and West Germany, in particular, Henriques said. He noted the decline in the U.S. share of world exports from 18.8% in 1960 to 15.4% in 1976 and the continuing drop in this percentage.

In addition, Henriques stated, American growth in manufactur-

ing productivity has been the smallest of all other industrialized nations over the last 25 years, and this trend has worsened during the Carter Administration.

Two other economic indicators illustrate the inroads being made on the U.S. position by other nations: the deficit in the U.S. trade

(Continued on Page 85)

Warning to OEMs: Don't Take Floppy Disk Choice for Granted

By Rodney Crisp
Special to CW

After 14 months of intensive effort you have shipped your first new system. Every component incorporates state-of-the-art technology. You have little doubt that this system will obsolete competitive versions and afford a six-month lead in the market.

Then, the phone rings and your field engineer is in desperate need of media since the customer's disks won't work. A call to the media manufacturer reveals that the experimental samples he sent you last year are not in production.

Unfortunately, the specifications for your system require a unique formulation that will take six to eight weeks to provide and cost five times more than the standard product.

This scenario raises the dilemma of a current trend: taking the floppy disk for granted. The vast range of current applications makes it impossible for one disk to be everything to everyone. Consequently, OEMs should consider marketing/availability, technical evaluation and economics in formulating their floppy disk product plans.

Marketing Considerations

Diskettes are available in a variety of format configurations. The format divides the diskette into uniform addressed segments

facilitating data recording and retrieval. The format can be accomplished physically or electrically. Electrical formats, referred to as initializations, are readily available for many common configurations.

The question of media marketing/availability should be considered before defining your disk format. If you do not intend to actively market disks, the format should be common or your system must be capable of initializing. Since including initialization capability will increase system cost, a common format is often preferred.

If the application requires a unique initialization and you (the OEM) do not want to offer the capability with your system, work out a program with a reputable disk manufacturer early in your development cycle.

If you intend to actively market disks, you must consider product availability at competitive prices for your customer. A program aimed at your exclusive offering must include an extensive distribution effort. You must also ensure your price does not appear excessive to the user. Several systems have lost sales and created customer ill will because of perceived media price gouging from the system manufacturer.

If technical ramifications require the use of a unique medium, granting a manufacturing license to one or more manufac-

turers is often a safer control approach than an exclusive marketing effort.

Evaluation Considerations

The diskette user's main concerns are durability and freedom from defects which might cause data errors. From a system design viewpoint, it is important to remember that the end user considers any malfunction of the system a data error. Such errors may in fact be caused by software, hardware or magnetic media.

The user will not be able to determine the cause of the problem, especially if he encounters a transient or "soft" error, which rarely occurs in exactly the same way.

To be sure your disk system will operate under the tolerances in your specifications, an evaluation of diskettes must be made and should include the following:

- Modulation: Low frequency amplitude variations in signals reproduced from the media.
- Overwrite: Residual signal remaining after erasure.
- Dropouts: Missing bits.
- Dropins: Extra Bits.
- Durability: Media and head wear under various operating environments.
- Amplitude: Strength of signals reproduced from magnetic media.
- Resolution: Ratio between

(Continued on Page 86)

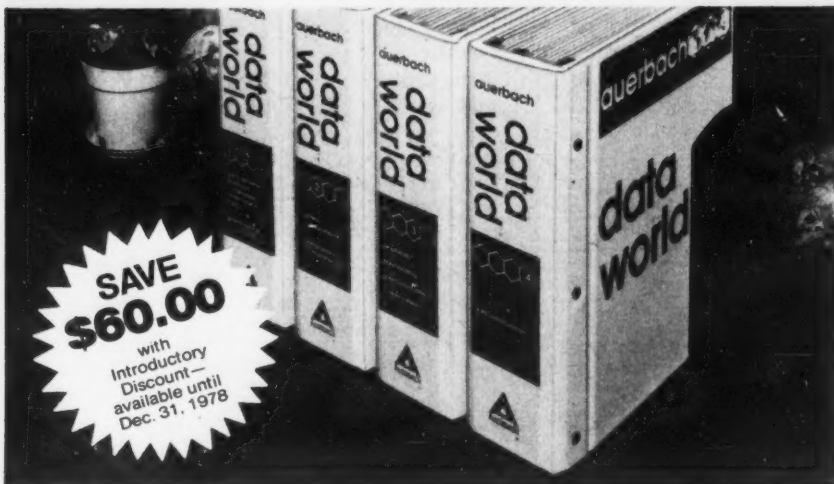
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- ▲ limited product coverage per each category:
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Information compiled, Summer, 1978

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Two Banks Agree to Form Separate DP Subsidiaries

NEW YORK — The Association of Data Processing Service Organizations (Adapso), which upholds the principle of maximum separation of banking and computer services, recently received strong support for its position with two out-of-court settlements with Citibank NA and Chase Manhattan Bank NA.

In both instances the banks have voluntarily agreed to provide computer services through totally separate subsidiaries.

In May 1977, Adapso, which represents the nation's \$6.9 billion computer services industry, asked the federal court in New York for a declaratory judgment against Citibank and the U.S. Controller of the Currency. It requested that the bank be restrained from selling or leasing DP services and the controller be restrained from authorizing national banks to sell such services.

Separate Business

Accordingly, Citibank has agreed to operate Interactive Computer Center as a totally separate business and not use Citibank in its name.

In a parallel settlement, Chase Manhattan indicated to the Controller of the Currency that it will operate Managistics, Inc., specializing in computer payrolls, which it is in the process of acquiring, as a separate profit center with its own management, personnel, facilities and equipment.

Chase pointed out that Managistics will not use "Chase" in its name and will market its service and otherwise conduct its commercial activities independent of Chase.

Letter Sent

In a letter to Adapso, Chase noted that Managistics, as a separate profit center, will "account for its profits and losses in accordance with generally accepted accounting practices."

Jerome L. Dreyer, Adapso's executive vice-president, said the association "was extremely pleased with both settlements. The banks have set the tone for the entire banking industry by agreeing to sell computer services only through independent operations."

"These terms parallel Adapso's long-time interest in eliminating cross-marketing of computer services by banks and other financial-related industries," Dreyer pointed out.

Complaint Against Citibank

Adapso and six member companies — ADP Network Services, Inc., Comshare, Inc., National CSS, Inc., On-Line systems, Inc., Quantum Computer Services and Tymshare Corp. — filed a complaint against Citibank in May 1977.

In that citation, Adapso said Citibank announced its intention to offer computer time-sharing services to business firms. It subsequently advertised it would market such services at 50% of the prevailing charges, on an incremental cost basis.

Citibank told Adapso it would "establish without delay and would request approval from the Federal Reserve Board for the subsidiary to offer Interactive Computer Center DP services. The subsidiary would own [Interactive's] computers and would

have a separate sales force for marketing the DP services.

"All of the subsidiary services would be fee-based, and offered without regard to balances in customer accounts. In short, such services would not be subsidized, but be priced on an economic basis so as to show the subsidiaries true profitability," Citibank said.

Posture Cited

Commenting further on the highly favorable settlements, Dreyer noted, "Adapso's complaints are historically consistent with its posture on similar related bank issues over the past 10 years."

Adapso has long taken the position that competition is greatly restricted through cross-marketing. This occurs when banks enter the commercial computer services market often because of idle or excess computer capacity. They are then in the position to use their bank and financial leverage to gain entry to a customer base.

In addition, Adapso said, they often sell computer services on a break-even basis, using banking influence to gain commercial accounts.

Lear Siegler Seeks Outlets

ANAHEIM, Calif. — The Data Products Division of Lear Siegler, Inc. is building a network of distributors to market the company's small business computer system, the VDP-100.

Over the next six to 12 months, the company expects to enter into agreements with firms worldwide that will provide software and market the \$21,000 system, according to Cathy Raftery, product marketing manager.

"For the most part, we expect the distributors to be systems houses, service/time-sharing bureaus and other firms which have access to programmers. The distributors will have responsibility for creating applications software, although Lear Siegler will back them with its applications engineering group," Raftery explained.

Now OEM

The Data Products Division of Lear Siegler now sells most of its products through traditional electronics distributors and on an OEM basis.

"There will be a minimum of overlap between the VDP-1000 distributors and our other outlets, since few electronic distributors have programming capability," Raftery noted.

The VDP-1000 agreements are being offered on a nonexclusive basis primarily in the largest U.S. markets. To date, five agreements have been signed.

Distributors will be expected to order 25 systems over a one-year period and develop a strategy for first-time users and customers who might have limited DP experience — probably in a time-sharing situation, she added.

"Typical applications will be in accounts receivable, payroll, inventory and other general business requirements for customers with \$500,000 to \$10 million in annual sales," she said.

Diversion for Military Purposes Feared CDC Sale to USSR Nixed on Security Ground

By Edith Holmes

CW Washington Bureau

WASHINGTON, D.C. — The Carter Administration denied the sale of a Control Data Corp. computer system to the Soviet Union more than a year ago on grounds there were no reliable means of detecting the diversion of the Cyber 76 for military purposes, according to the recently declassified report of a congressional hearing.

Held before the House Subcommittee on International Economic Policy and Trade on June 27, 1977, the hearing examined the Commerce department's refusal to grant CDC an export license for the system.

Stanley J. Marcuss, deputy assistant secretary of the Commerce Department, expressed the government's fear that the system, slated for use by the Soviets in weather research and forecasting at the Hydrometeorological Center (Hydromet) in Moscow, could be diverted to such military tasks as nuclear weapons design and missile tracking and guidance.

No Safeguards

In the Administration's view, no practical safeguards were available to detect diversion of the Cyber 76 to applications that "would pose a serious threat to our security."

CDC maintained, however, that the upgrade of the Soviet system at Hydromet would add much valuable weather information to the world Meteorological Organization (WMO). The WMO is a United Nations effort involving 150 national weather centers feeding data to 22 regional centers which, in turn, provide data for final processing and dissemination from

three major centers in Washington, D.C.; Melbourne, Australia and Moscow.

Robert D. Schmidt, executive vice-president of CDC, told the congressmen the world weather project depends on a greater computing capability at Hydromet — on the order of the 11-year-old Cyber 76, with its ability to process 723.5Mbit/sec. "We have every reason to believe the USSR will use the computer for the stated end use and only for that purpose," Schmidt maintained.

"Conditions and safeguards can be applied to the computer that will minimize the possibility that operation of the machine could be diverted from its

authorized weather data function and that assure all CDC support for operation of the machine would be withdrawn, including spare parts, causing the machine in a short time to become inoperable," he added.

In opposition to CDC's contention that it had not been given a fair hearing and had a right to know what national security reasons prevented U.S. sanction of the sale, Marcuss voiced the government's awareness of the need to carefully balance apparently conflicting considerations.

The Commerce Department, in particular, acknowledged U.S. leadership in computer technology and wanted to maintain that standing abroad, in addition

to using this technology to reduce the growing U.S. trade deficit, Marcuss noted.

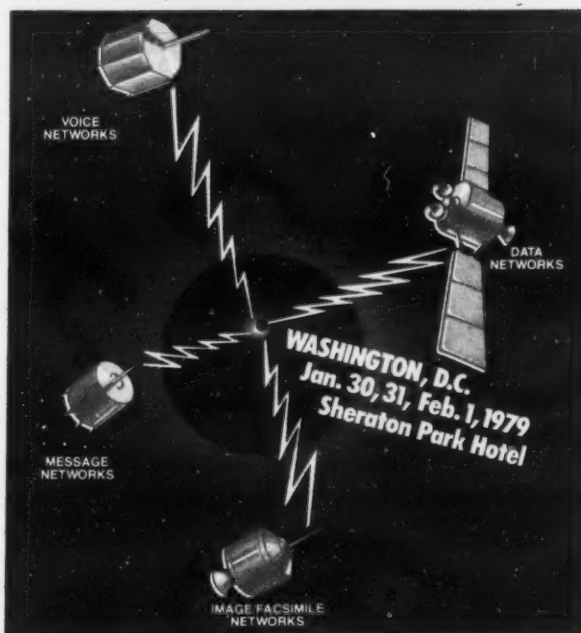
"It is estimated that computer sales to eastern Europe and the Soviet Union could amount to many billions of dollars over the next decade, so the economic consequences are not insignificant," he said.

"On the other hand, the Administration has no intention of authorizing sales of U.S. computers — or any other items, for that matter — where the sale would be detrimental to the national security," Marcuss stated. "We feel confident that we are the best judges of our national security interests."

(Continued on Page 86)

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Cbema Slams Stand by Carter

(Continued from Page 83)

balance of manufactured goods is increasing and the international value of the American dollar continues to fall, Henriques said.

American industry needs the support of the federal government — not hand-holding of businessmen seeking to close a deal with the Soviet Union or any of the other countries with centrally planned economies, but recognition by the White House and Congress that intervention in commercial transactions "is counterproductive and detrimental" to the U.S., he said.

Cbema suggested that a clear line be drawn between those goods, services and technology that require government intervention and those that do not.

"This line should serve to limit government intervention to transactions involving (1) arms, ammunition and implements of war; (2) specially designed components and test equipment for those items; (3) technology for using and manufacturing those items; (4) critical technology not necessarily related to the foregoing, but which would be a militarily significant enhancement to any adversary country; and (5) the 'keystone' equipment without which any of these products and technology would be rendered inoperative," Henriques stated.



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OEMs Advised On Disk Choice

(Continued from Page 83)

readback signal amplitudes recorded at different frequencies.

- **Peak Shift:** Variation of the positions of the peaks of a played back recording relative to their proper positions.

The cost associated with a thorough disk evaluation will be at least \$40,000 and the process may take more than 50 days. The costs and times required are shown in the accompanying chart.

Picking Manufacturer

Saving diskette evaluation time and money begins with selection of a drive manufacturer. First, ask your potential drive vendors for a list of qualified media manufacturers. A drive vendor with only one qualified source may require that you evaluate other diskette vendors since one qualified source represents potential price or availability problems.

Next, request evaluation results, quantity tested and the date the last evaluation was performed.

Finally, review your application with the drive manufacturer. Get its assessment of the parameters that may create concern and request any data it might have relative to the relationship of various diskette parameters and your application.

After reviewing your situation with drive vendors, contact several diskette manufacturers. Ask the diskette vendors how their media operate on the drive selected. Compare these inputs

to the ones your drive manufacturer gave you. (Differences will point out areas which will require further evaluation).

Same Questions

Ask the diskette vendors the same questions you asked the drive manufacturers. The quantity and quality of the data you receive from the vendors will isolate those areas you will want to investigate further and will give you

insight into the technical competence of your suppliers.

If the results from various media manufacturers agree, you can have confidence in the evaluation and can confidently make your vendor decision. If the results do not agree, request a visit to the diskette facilities to review the tests performed. Only if the results are still inconclusive should you initiate an evaluation program of your own.

After you have selected diskette vendors, it is advisable to request ongoing audits of critical parameters. This information often requires use of one of your systems by the media vendor. The diskette vendor should also have capabilities to perform many evaluations on his own.

After your evaluations are complete and your diskette vendors are selected, send a letter to the vendors letting

them know if they have qualified. If they have not, let them know why and what they must do to be reconsidered.

Vendor notification is critical to ensure availability of your product. Continuous requests for data will ensure your vendor keeps your requirements in mind when decisions on process changes are being considered.

Diskette evaluation and vendor selection doesn't have to be a costly and laborious task. Consider your market strategy before you spec your product. Request assistance from drive and media manufacturers and perform only those evaluations that represent potential problems.

Proper attention to these considerations should allow you to join the select group of OEMs that are able to take diskettes for granted.

Crisp is market product manager for Information Terminals Corp.

| EVALUATION PARAMETER | EQUIPMENT COST | QUALIFICATION EXPENSE | QUALIFICATION TIME | ONGOING AUDIT EXPENSE | FREQUENCY |
|-------------------------------|--|--------------------------|-----------------------|---|-------------|
| Modulation | 0-Scope | \$600/Vendor | 3 Days/Vendor | \$200/Vendor | Semi-Annual |
| Overwrite | \$3000-\$4000 | \$400/Vendor | 2 Days/Vendor | \$150/Vendor | Semi-Annual |
| Dropins/Dropouts | \$10,000 to \$35,000 | \$600/Vendor | 3 Days/Vendor | \$.50/Disk | Continuous |
| Durability | \$8000 to \$10,000 | \$1400/Vendor | 8 Days/Vendor | \$1400/Sample | Quarterly |
| Amplitude/ Resolution | (Requires selection of STD heads and media and should be accomplished in conjunction with drive and media vendors) | | | | |
| Peak Shift* | \$20,000 to \$30,000 | \$600/Vendor | 3 Days/Vendor | \$.50/DBR | Continuous |
| TOTALS | \$41,000 to \$79,000 | \$3600/Vendor | 8 - 19 Days | \$6300/Vendor +.50 to \$1.00/disk | Annual |
| Minimum of 3 Vendors=Total | \$41,000- \$79,000 | \$10,800 | 24 - 57 Days | \$18,900 + .50 to 1.00 disk | Annual |

*Would be done in conjunction with test for dropouts and dropins in some cases

Estimated Cost and Time Required for Diskette Evaluation

Security Fears Halted Sale

(Continued from Page 85)

Even if the system were not diverted to unauthorized purposes, certain Soviet work with weather, such as weather modification, could prove detrimental to U.S. security, Marcuss said.

The departments of State and Defense concurred with the Commerce Department's decision to deny the export license to CDC. Representatives from those government units indicated the NBS panel's conclusion that adequate safeguards against diversion have not and could not be devised was the evidence that persuaded them the application should not be granted.

Size at Issue

The Commerce Department objected to the sale in part because it believed the Cyber 76 to have many times the computational capability of any mainframe ever approved for export to a Communist country.

Schmidt and CDC vice-president Hugh P. Donaghue compared the Cyber 76 with the Cray Research, Inc. Cray-1 and CDC's own Star-100. They argued that the Cray-1 is 10 times more powerful than the Cyber 76, for example.


"This computer," they said in reference to their proposed sale to the Soviets, "if anything, is probably under performance" for the overall needs of the WMO efforts.

The CDC executives called "absurd" the government's suggestion that "occasional one-tenth of one second bursts of unauthorized use could be sneaked, undetected, from the Cyber 76 to the detriment of U.S. strategic interests."

Schmidt maintained that "the performance of its weather assignment only would fully occupy the capabilities of the Cyber 76 and any neglect of those functions would be evident immediately to other members of the world weather system, including Washington."

CDC would send two employees along with the system to Hydromet. Should any diversion of the computer from weather research and forecasting be picked up, CDC would withdraw these people and all spare parts, rendering the equipment useless in a number of weeks.

"It is naive to believe that the Soviets are not rapidly developing an indigenous computer industry," Schmidt concluded.



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Users Have Choice of 650

Doubled Market for DBMS Found in Japan

By Marcia Blumenthal
CW Staff

WALTHAM, Mass. — The Japanese market for data base management systems (DBMS) has more than doubled over the past few years, with many suppliers now developing packages aimed at small and medium systems.

More than 650 DBMS packages from computer manufacturers or software are currently in use according to *EDP Japan Report* (EDP/JR), a publication of International Data Corp., a market research firm here.

Mainframers competing for DBMS business, like IBM, are primarily interested in selling more hardware and view DBMS packages as a means of defending their customer bases from competition, EDP/JR said. Domestic mainframe makers are therefore zeroing in their marketing efforts on their own "in-house" markets.

A relatively large number of installations presently are using domestic packages because mainframers offer their customers these packages free of charge, EDP/JR said. Fujitsu Ltd and Nippon Electric Co. are each offering three DBMS packages.

Burroughs, IBM Aggressive

Of the U.S. mainframers, EDP/JR cited Burroughs Corp. and IBM as the most aggressive in the sales of DBMS software. For instance, 99% of the medium- to large-scale Burroughs users are said to be employing DMS II, with some of those packages already sold to major banks.

IBM's package, IMS, has captured 10% of the user base in Japan. One user commented that IMS should be considered a "silent salesman" because the user is compelled to upgrade the CPU and/or increase the amount of memory once IMS is installed.

However, IMS has achieved widespread acceptance in Japan chiefly because there was no competing DBMS software at the time it was introduced in Japan in the early 1970's. EDP/JR also credited the acceptance of IMS to IBM's reputation in Japan, which encourages Japanese users to rely on IBM software packages.

Independent systems and software houses face two basic problems in competing for Japanese DBMS business, EDP/JR stated. In addition to the strong loyalty to IBM products and services, users lack total confidence in products offered by independents.

However, this outlook is changing gradually in favor of the independent

software houses, EDP/JR suggested, because of a growing consciousness among Japanese users and because of the expanding customer base which software houses are gaining in the overseas markets.

Japanese computer users are highly sensitive to the reputation of products in foreign markets, the newsletter observed.

Four DBMS packages are being sold in Japan by foreign-based systems houses. While the main target for these packages are IBM users, vendors are now trying to penetrate the expanding IBM-compatible "M" series user base, EDP/JR noted.

Of the four DBMS packages, Adabas

from Software AG, System 2000 from MRI Systems Corp. and IDMS from Cullinane Corp. are running neck-and-neck; Cincom Systems, Inc.'s Total dominates the medium-scale systems market, EDP/JR reported.

Cincom, which earlier this year established a wholly owned subsidiary, Cincom Systems (Japan) Ltd., offers 24-hour service and emphasizes rental rather than outright purchase because of the tightening DP budgets of some users.

User Criteria

Once the decision has been made to acquire a DBMS package, EDP/JR said, the typical user compares at least

three different packages, assessing on-line capability, query capability, vendor support and cost benefits.

One user EDP/JR interviewed noted that "successive improvements and functional upgrades of DBMS packages tend to make almost every package look alike. The key to selecting the right package is to check performance efficiency in relation to processor capacity by using a series of benchmark tests."

EDP/JR found more than 50% of the DBMS packages are installed in manufacturing industries, particularly durable goods manufacturing, followed by insurance, government, banking, transportation and service bureaus.

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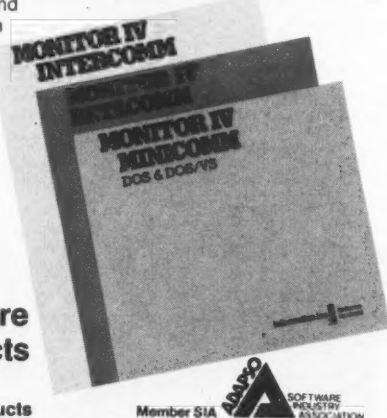
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Orders & Installations

TRW Ross Gear Division, headquartered in Lafayette, Ind., has ordered a Univac 1100/12.

Reynolds Metals Co. has installed a Control Data Corp. 38500 mass storage system valued at approximately \$400,000 at the firm's management information services computer center in Richmond, Va. The system is attached to an IBM 370/158 and an Amdahl Corp. 470V/6 that handle most of Reynold's corporate DP activities.



Harris Earnings Up 30%, Top \$52 Million for '78

CLEVELAND — Harris Corp.'s earnings for fiscal 1978 increased 30% and its sales, 35%. Harris executives credited the healthy gains to the rapidly growing role of the communications and information handling industry in the world economy.

Unaudited earnings for the fiscal year ended June 30 were \$52.1 million or \$4.22 per share compared with last year's earnings of \$40.1 million or \$3.26 per share. Revenues, also unaudited, topped \$872 million, up from 1977 sales of \$646 million.

For the fourth quarter, Harris reported revenues of \$254.3 million and earnings of \$15.4 million or \$1.24 per share. During the corresponding period a year ago, the firm

logged sales of \$198.8 million and earned \$12.4 million or \$1.01 per share.

Chairman Richard B. Tullis said new orders in fiscal 1978 exceeded the billion dollar milestone for the first time. The year-end backlog stood at \$600 million, up 33% from the \$450 million in unfilled orders at the beginning of the year.

Harris executives reported that earnings have grown at a compound rate of 24% for the past seven years.

International sales rose 36% from the previous year and accounted for \$307 million or 35% of the total.

Expenditures for research and development increased from \$73 million to \$89 million, and the firm invested \$72 million to provide additional production capacity.

Data 100 Per-Share Results Dip as Result of Dilution

MINNEAPOLIS — Data 100 Corp.'s earnings for the first half of both fiscal 1978 and 1977 remained about the same, but per-share earnings dipped significantly. However, Edward D. Orenstein, the firm's president, said the slip in earnings per share was primarily the result of a 62% increase in the number of fully diluted shares compared with the second quarter a year ago.

Earnings for the second quarter of 1978 were \$1.1 million or 16 cents per share compared with \$1.2 million or 28 cents per share last year. No tax loss carryforwards were reported for 1978, but a \$155,000 carryforward was reported for the second quarter of 1977, which lowered the current quarter's earnings below 1977 levels.

Revenues for the second quarter topped \$39.6 million, up 19% from the \$33.4 million reported for the corresponding period a year ago.

Revenues for the first six months of 1978 reached \$76.6 million, a 23% increase from \$62.3 million a year ago. Earnings were \$2.5 million for the half or 38 cents per share, compared with last year's earnings of \$2.5 million or

68 cents per share.

Orenstein said that although revenues increased during the past year, net operating results were affected by increased costs, including a substantial increase in investment in new product

Financial News

development, particularly for software.

Worldwide end-user shipments and backlogs for the first half were ahead of 1977 six-month results, but, according to Orenstein, did not grow as fast as anticipated. However, he noted that orders for the second quarter were significantly ahead of those for the first quarter, particularly for the U.S., which will contribute to increased second half shipments.

Data Dimensions Doubles Net

GREENWICH, Conn. — Data Dimensions, Inc. reported record earnings of \$319,000 or 41 cents per share for the first half of fiscal 1978, double last year's six-month earnings of \$159,000 or 21 cents per share.

Sales for the period jumped 47%, reaching \$7.2 million compared with 1977 six-month revenues of \$4.9 million.

For the second quarter, Data Dimensions netted \$171,000 or 22 cents per share, a 94% increase from earnings of \$88,000 or 12 cents per share for the comparable period a year ago. Revenues also increased 46%, topping \$3.6 million, up from second quarter 1977 revenues of \$2.5 million.

Lester M. Gottlieb, president of Data Dimensions, noted the growth in profits and said the firm plans a public offering during the third quarter.

Magi Earnings Double For First Quarter

ELMSFORD, N.Y. — Mathematical Applications Group, Inc. (Magi) reported net income doubled and revenues showed a 40% gain for the first quarter.

Revenues reached \$632,270, up from \$451,856 in the previous year's first quarter.

Earnings leaped to \$101,389 or 10 cents per share from \$46,192 or five cents per share a year ago.

Dr. Phillip S. Mittelman, Magi's president, said the gains were from continued growth of operations in the computer graphics field and record volume in the computerized direct mail division.

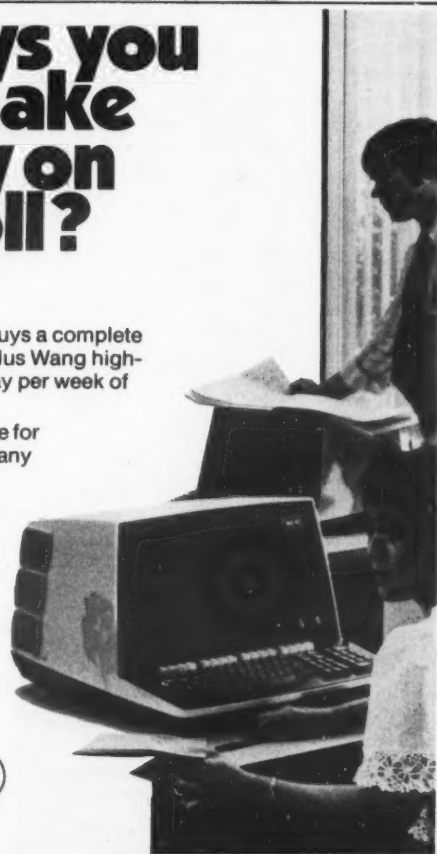
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Unit to Mix Phone, TV, Personal DP Report Eyes Billion-Dollar Market for 'IVT'

NEW CANAAN, Conn. — Current trends in the home computer and videotape recorder fields will lead to the emergence of an integrated video terminal (IVT) within the next four years that will combine the home telephone, TV set, videotape recorder and personal computer, International Re-

source Development, Inc. (IRD) has predicted.

The IVT will represent a billion-dollar industry within the next 10 years and will bring about significant changes in the publishing, consumer electronics, broadcasting and telecommunications industries, IRD said in a report entitled "The Home Terminal."

IVT, the report suggested, will serve as the primary home tool for entertainment, publishing access, home appliance control and correspondence via electronic mail services.

IRD consultants detailed current experiments in interactive TV, such as the Qube experiment in Ohio and Viewdata in England, which point to a

strong consumer demand for interactive TV services. This demand will lead to the concept of "narrowcasting" rather than "broadcasting," IRD claimed.

Japanese Ahead

While the Japanese are currently ahead in the terminal integration race, a major opportunity for innovative breakthroughs exists for U.S. industry participants, particularly for the second-generation IVT, the report said.

Initially IVTs will be sold through retail outlets, IRD predicted. As the device assumes a more important role in the consumer's lifestyle, however, the

marketing mode will become more like an automobile dealership, with specialized dealer outlets.

An oligopoly of IVT sourcing will arise which will match the automobile industry structure, IRD suggested.

The leaders in this future giant industry, IRD said, will probably not be home computer manufacturers or television manufacturers, but vertically integrated companies with solid-state computer and consumer manufacturing and sales experience. It suggested IBM and Texas Instruments, Inc. as likely industry leaders.

The report costs \$895 and is available from IRD at 125 Elm St., P.O. Box 1131, New Canaan, Conn. 06840.

Nickels & Dimes

Directors of **Unitrode Corp.** have declared a regular quarterly dividend of 5 cents a share payable October 2.

\$\$\$

Reliance World Trade Co. Ltd. (formerly known as Leasco World Trade Co. Ltd.) has plans to redeem all of its outstanding 5% guaranteed convertible debentures due 1888 on Sept. 25. The redemption price of the debentures totaling \$12.6 million will be 101.5% of the face amount plus accrued interest.

\$\$\$

The board of directors of **Analogic Corp.** recently voted to split its common stock on a 2-for-1 basis by means of a 100% stock dividend as of Sept. 1. The dividend shares will be issued on or about Sept. 12, the company said.

\$\$\$

Centronics Data Computer Corp. has declared a 25 cents a share quarterly cash dividend payable Oct. 9. This is the 12th consecutive quarterly cash dividend paid by Centronics.

\$\$\$

Caesars World, Inc.'s Ontel subsidiary has arranged a \$4 million, three-year revolving credit agreement with the First National Bank of Boston.

\$\$\$

Greyhound Computer Corp. extended its tender offer to acquire the outstanding common stock of its 97.7% owned subsidiary, **EDP Resources, Inc.** Under the terms of the tender offer, which will expire today unless extended, Greyhound will pay \$7.25 per share to the seller in cash.

\$\$\$

Modular Computer Systems, Inc.'s proposed public offering of 800,000 common shares has been delayed until the company can provide the Securities and Exchange Commission with more information about its 1976 financial statements, in which the company reported a loss of \$4.1 million. "It's going to take some time to gather the data," a Modcomp spokesman said.

\$\$\$

Decision Data Computer Corp. said it prepaid \$7.2 million of bank debt. The sale of its "96-column" keypunch equipment to North American Corp. provided the funds for the prepayment, the firm said.

\$\$\$

National Computer Systems, Inc. has declared its 11th consecutive quarterly cash dividend. The five-cent dividend is payable Sept. 26.

\$\$\$

Directors of **Bunker Ramo Corp.** declared a 12 1/2-cent quarterly dividend on its common stock and a \$1.50 quarterly dividend on its cumulative convertible preferred stock. Both dividends are payable Sept. 29.

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Cray Research, Inc. said a computer system now leased to a government agency has been sold to a partnership for \$7.1 million. The partners are subsidiaries of U.S. Leasing International, Inc. and St. Paul Cos. Cray reported it will share in certain future rentals generated by the system and has the option to repurchase the equipment from the buyer.

Hewlett-Packard Co. reported it obtained an option to purchase about 150 acres of land near Spokane, Wash., for an electronics plant.

Advanced Micro Devices, Inc. has agreed to buy 50 acres of land in Austin, Texas, which will house a new \$5 million plant for the production of high-density semiconductor memories, telephone switching systems and related

instruments.

Turner Construction Co. has been selected as general contractor to build an IBM office building at Madison Ave. and 57th St. Construction on the 43-story building is slated to start in August and is expected to be completed by 1981.

LeBlond NC Systems has officially changed its name to Manufacturing Software & Services to better describe the expanded scope of its operations.

Teradyne, Inc. has purchased the assets of Digitest Corp. of Dallas, Texas. The assets pur-

Supershorts

chased principally involve the D-Lasar software system, a computer program for generating test routines for complex digital circuits.

Software Module Marketing, Inc. (SMM) has signed agreements with six companies to represent its entire line of system software in Europe. Representing the SMM line in Europe are: Carus France, Data Process b.v., DataAnalys AB, HIS Consultants AG, Selestia Sistema and Software Implementation Ltd.

Able Computer Technology, Inc. has expanded its manufacturing capability and moved the entire function to Able Computer Technology, Puerto Rico, Inc., an independent company wholly owned by the principals of the founding company. Kenneth Omohundro, president, said the move was based upon the

need to simplify shipping of Able products.

The Terminals Division of Perkin-Elmer Corp. has signed a full-service distributorship agreement with MQI Computer Products, a division of MQI Corp., to distribute its Model 1100 interactive and Model 1200 Owl editing CRT terminals.

Dynalogic Corp. Ltd., an Ottawa-based computer peripherals manufacturer, has appointed California Computer Products, Inc. a distributor for its Series 7000 Dyna-term disk product line.

American Microsystems, Inc. (AMI) received a contract from IBM to develop and design an MOS/LSI random-access memory chip utilizing AMI's VMOS semiconductor technology.

NEC Microcomputers, Inc. has become a second source for the 8085A family of microprocessors and principal support chips.

Spur Products Corp. has regained exclusive rights to manufacture and distribute the 1403 printer controller from Grumman Data Systems Corp. The product was originally developed by Spur and subsequently sold to Grumman in 1974.

Omron Electronics, Inc. has selected D.B. Associates of Dewitt, N.Y., and John Hopkins Associates, Inc. of Bryn Mawr, Pa., to represent CRT terminals and related EDP equipment produced by Omron's Information Products Division.

Datum, Inc. created a new direct sales region with the establishment of its New England District and has named Robert Blue as district sales manager for the new territory to be headquartered in Framingham, Mass.

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Harris Corp.'s Data Communications Division has moved into its \$7 million, 250,000 sq-ft Dallas headquarters. Initially, the facility will house nearly 700 of the division's 1,800 employees worldwide.

International Memories, Inc. has moved its facilities to a 30,000 sq-ft plant and office building at 10381 Bandleby Dr., Cupertino, Calif. 95014.

Dataproducts Corp. has broken ground for a 111,000 sq-ft headquarters building to be constructed on a 10-acre site at 6200 Canoga Ave., Woodland Hills, Calif. The \$5 million structure will house 400 employees with room for 100 more.

Data Printer Corp. has relocated its offices and now occupies a 182,000 sq-ft facility at 99 Middlesex St., Malden, Mass. 02148. The facility will accommodate production, engineering, quality control, test and laboratory space and corporate offices.

Kennedy Co. has opened a new Long Island sales office at Suite LL15, 350 Vanderbilt Motor Pkwy., Hauppauge, NY.

Precision Monolithics, Inc. has had a major realignment of its regional sales offices. Full addresses are as follows: Central Regional Sales Office, 605 E. Algonquin Rd., Arlington Heights, Ill. 60005; Eastern Regional Sales Office, 200 W. Cummings Park, Woburn, Mass. 08101; Southern Regional Sales Office, 115 Palm Bay Road, N.W. Palm Bay, Fla. 32905.

Systems & Programming Re-

Expansions

sources, Inc. (SPR) has opened a district office in Chicago. SPR provides contract human resources and software program products.

Telefile Computer Products, Inc. has established a Canadian subsidiary at 240 Duncan Mill Road, Don Mills, Ontario M3B 1Z4.

Pansophic Systems International, Inc. has opened a European Training and Support Center in IJsselstein, the Netherlands. The center will offer basic orientation and ad-

vanced concept courses in Panvalet, Easytrieve and Panexec. Management courses are currently in the developmental stages.

Perkin-Elmer Corp.'s Terminal Division has broken ground for an 80,000 sq-ft administrative, development and manufacturing facility on a 30-acre industrial site in Mount Olive, N.J.

LH Research, Inc. has begun construction of an 80,000 sq-ft facility at 14402 Franklin Ave., Tustin, Calif.

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Intel 80/30 Offers Dual-Port RAM Capability

SANTA CLARA, Calif. — Intel Corp. has introduced its ISBC 80/30, the third-generation single-board computer in Intel's family of compatible ISBC-80 products targeted for the OEM market.

The ISBC 80/30 includes 16K bytes of dual-port read/write memory, sockets for an 8041/8741 universal peripheral interface, full Multibus allowing up to 16 masters to share the system bus, a 12-level vectored priority interrupt structure, a programmable communications interface, 24 programmable I/O lines with sockets for interchangeable line drivers and line terminators and full system development software support.

The 16K bytes of random-access memory (RAM) are resident on a single 80/30 board. Previously, multiboard configurations were required to provide an equivalent amount of RAM for ISBC products, according to the firm.

The 80/30's dual-port capability allows the on-board RAM to be accessed by both the on-board MPU and any other external Multibus master interfaced to the system. The dual-port capability also provides a triple bus architecture — the on-board bus, the dual-port bus and the system bus.

The 80/30 provides a socket for interfacing with a user-

supplied 8041/8741 universal peripheral interface chip, a single chip microcomputer containing a CPU, 1K byte of read-only memory (ROM) or erasable-programmable read-only memory (Eprom), 64K bytes of RAM, 18 programmable I/O lines and an 8-bit timer.

The chip functions as a slave processor to the 80/30's 8085A MPU by controlling user peripherals in the chip.

Both a parallel and a serial I/O interface are included in the 80/30. This is accomplished because the ISBC 80/30 contains 24 programmable parallel I/O lines implemented using the Intel 8255A programmable peripheral interface and

a programmable serial communications interface implemented using Intel's 8251A

ISBC 80/30 so the user can match interrupt request processing methods to system re-

quirements, Intel said. These modes, which can be changed dynamically, include fully nested, autorotating, polled and specific priority.

Intel's RMX/80 real-time multitasking executive software, designed for the ISBC

80 computers, provides the capability to monitor and control multiple asynchronous external events, Intel said. It is provided as a linkable and relocatable module requiring only 2K bytes of memory space.

For software development of the 80/30-based products, the company provides the Intel development system. The Intel ISBC 80/30 costs \$1,160 from Intel at 3065 Bowers Ave., Santa Clara, Calif. 95051.

OEM Products

Universal Synchronous/Asynchronous Receiver/Transmitter (Usart).

The ISBC 80/30 provides vectoring for 12 interrupt levels, four of which are handled directly by the interrupt processing capability of the 8085A MPU and represent the highest priority interrupts of the 80/30.

Four priority processing modes are provided in the

TI Has CMOS Version Of TMS1000 Micro

DALLAS — Software-compatible CMOS versions of the TMS1000/1200 4-bit microcomputers, intended primarily for applications requiring lower power consumption and higher speeds, have been introduced by Texas Instruments, Inc.

The TMS1000C series offers a flexible supply voltage (3V to 6V), 5mW operation at 5v and a 1 MHz clock rate.

It also features three subroutine levels and eight data inputs in the TMS 1200C 40-pin package, offering double the number of data inputs in the original P-channel TMS1000 family, according to the firm.

The CMOS versions also

provide a power-down mode, controlled by the halt pin, that drops typical power consumption to 5 microwatts while preserving memory and the current machine state, the firm said.

Each TMS 1000C microcomputer has ALU, control, clock, I/O circuits and memory on a single chip. The random-access memory is organized as 64- by 4-bit words with the read-only memory organized as 1K-by 8-bit words.

The volume price of each unit is under \$5, TI said. Additional information is available from the vendor through P.O. Box 1443 M/S 653, Attn: TMS 1000C, Houston, Texas 77001.

Zilog Micro Unit Permits High-Level Language Use

CUPERTINO, Calif. — Zilog, Inc. is offering microcomputer users an "OEM-oriented" system, the MCZ-1/05, supported by high-level languages and the company's RIO operating system.

The MCZ-1/05 incorporates Zilog's Z80 CPU and 16K random-access memory (RAM) chips. Cobol, PL/Z, Basic and Fortran IV run on the system, the firm said.

The system contains two dual floppy disk drives with 600K bytes of on-line data and program storage, according to the firm. Designed for desktop use, the system has 64K bytes of RAM, with 3K bytes of programmable read-only memory (Prom) and 32K bytes of RAM standard.

The system uses two of Zilog's MCB series boards; the Z80 MCB microcomputer board and Z80 MDC memory disk controller board.

Other features include a se-

rial I/O port with RS-232C or strappable current-loop interface and Zilog's disk operating system including Macroassembler that generates relocatable code, linker, text editor, file utilities and logical I/O.

The MCZ-1/05 sells for \$4,750 in single quantities and \$4,000 in quantities of 25 or more from Zilog, 10340 Bubb Road, Cupertino, Calif. 95014.

New Registrations

WANG LABORATORIES, INC., One Industrial Ave., Lowell, Mass. 01851, has filed to register 500,000 shares of Class B common stock. Underwriters: Merrill Lynch White Weld Capital Markets Group and Paine, Webber, Jackson & Curtis, Inc.

COMPUTER NETWORK CORP., 5185 MacArthur Blvd. N.W., Washington, D.C. 20016, has filed to register 387,316 shares of common stock. No underwriter is involved.

NATIONAL CSS, INC. has filed to register a planned public offering of \$18 million of 10-year convertible debentures through underwriters Paine, Webber, Jackson & Curtis, Inc.

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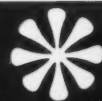
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Executive Corner

• William R. McEwen has been named division vice-president of field engineering and Barton L. Ott has been named division vice-president and director of software development at Data 100 Corp. The company has also named Lloyd R. Larson director of U.S. field engineering administration.

• James E. Brown has been appointed national sales manager at A.B. Dick. John R. White was named systems coordinator for the Easter Region.

• David I. Gould has been appointed director of head-

quarters marketing for Honeywell Information Systems, Inc.'s Minicomputer Marketing Operations in Billerica, Mass. Richard R. Douglas has been appointed vice-president and general manager of the company's Large Information Systems Division and Russell G. Henderson has been appointed vice-president and general manager of the company's Marketing and Services Information Systems

Division. Norman N. Feldman has been appointed vice-president of corporate manufacturing for HIS's worldwide operations.

• Robert G. Gilbertson has been named senior vice-president of marketing at Data Architects, Inc.

• John C. Christensen has been appointed director of product assurance at GTE Lenkurt, Inc.

• William R. Baker has been

named vice-president and controller for GTE Data Services.

• Lee C. Ross has been promoted to corporate director of marketing at Computer Management, Inc. James M. Sullivan has been promoted to marketing manager of the Systems Division, Robert Antall has been named director of the Data Services Division and Wayne Arnold has been appointed branch manager of

the Cleveland Computer Output Microfilm (COM) Division.

• Michael Jacobson has been elected vice-president and director of Vista Computer, Inc.

• Sunny J. Harris has been named vice-president of operations for Integrated Software Systems Corp.

• Larry Bruchey has been named corporate vice-president and general manager of University Computing Co.'s Scientific and Engineering Division.

• William E. Smilanich Jr. has been appointed director of advanced programs and contracts for Dynamic Sciences, Inc.

• Donald C. Beebe has assumed the duties of director of corporate operations for Dynamic Sciences.

• Troy W. Todd has been elected vice-president of human resources for United Telecommunications, Inc., succeeding John W. Lehman, who has become vice-president for the United Telephone System - Midwest Group.

• Charles Cort has been appointed manager of marketing support for the Pertec Division of Pertec Computer Corp.

• Roy L. Ash has been named to the board of directors of System Development Corp.

• Robert D. Morrison has been appointed manager of staffing resources for the Electronic Systems Division of Bunker Ramo Corp.

Dealer Meet To Cover Office Gear

CARLE PLACE, N.Y. — "Selling in a Major Key" will be one of the themes of the upcoming Eastern Regional Office Machine Dealers Association (Eromda) annual convention and exhibit in Philadelphia Nov. 2-4.

"The entire event has been arranged with the convenience of the dealer in mind," Eromda President Solon E. Paul said. Both the educational and social aspects of the convention have been concentrated in two days and a package price of \$42 per person has been set, he said.

Alfred B. "Burt" Aus will describe the skills now required to sell electronic systems such as word processors, minicomputers and related equipment. During the "Selling in a Major Key" seminar, Aus will compare these sales techniques with those required for traditional office machinery.

Special emphasis will be placed on the psychology of handling environmental problems and changes in the life style of employees as a result of the installation of automated systems.

For more information, contact Joe Doblmeier, Eromda, P.O. Box 32, Carle Place, N.Y. 11514.

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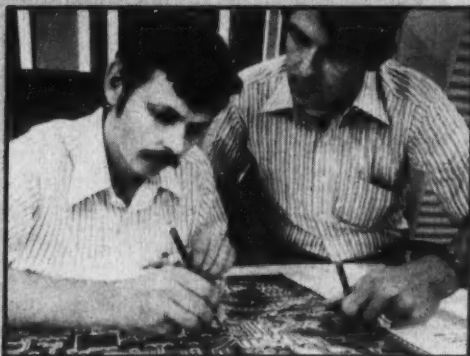
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Challenging positions available for results oriented individuals on various levels with this attorney related company. Our direction is to provide a variety of computer services for attorneys and we are seeking qualified persons to fill key positions relative to the development of those services. If you have a good background in systems design and a good working knowledge of IBM 360/370 Assembler Language or ANS Cobol, we are interested in hearing from you. Should you have a financial background and/or CICS/VS experience, that would definitely be a plus.

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Assistant Director of Student Administrative Services at Metropolitan State College. Position starts October 15, 1978. Duties include computer systems analysis, design and programming for Admissions and Records and Student Affairs. A Bachelor's Degree in appropriate academic area is required. Master's Degree preferred, not required. Knowledge of ANS COBOL mandatory; OS/VS or MVS preferred. Experience or education in systems analysis, Higher Ed. management information systems is desirable. Familiarity with CICS and/or ADABAS is valuable. Salary \$15,000 - \$15,750 dependent on qualifications. Deadline - September 25, 1978. Send resume, letter of application, transcripts and three letters of reference to Director of Student Administrative Services, Box 16, Denver, Colorado 80204.

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Where we're headed...

We have several major projects in work. One is our new virtual resource executive — a powerful system that combines COBOL with virtual operation. Another is a system which will provide interactive transaction processing capability for our virtual mainframes. And in the design process, we're looking for new approaches to software, firmware and testware development. On top of that, we're moving rapidly into VLSI technology with the support of NCR's own microelectronics facilities.

We're big on resources...

You need lots of high calibre equipment and technical support to take on projects of the magnitude we handle. You'll be working with our most powerful, new generation Criterion mainframes, the latest advances from our data communications divisions, a highly interactive battery of technical support specialists. And you'll have it all at hand in a plant-complex big enough to house your grandest ideas.

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We keep our project teams small. You work intimately with a few heavyweight professionals. That means, you come to grips with more of the problem, share more of the responsibility. It also means that everyone carries his or her full weight and stands out with high visibility.

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Our pioneering development groups are at home in Rancho Bernardo, 22 miles up the coast from San Diego. Our 114-acre hilltop location has been called "one of the 10 best-designed facilities in the nation." You'll be in the midst of California's finest recreational facilities, including 70 miles of beaches from San Juan Capistrano to the Mexican border. You'll work where others come to vacation.

WHAT'S NEW AT NCR?

NCR is on the move. We've mounted a major, coordinated effort, backed by ample R&D resources, to emerge up front in 1980s EDP. For example: VLSI technology, distributed network architecture with interactive transaction processing and important new functions, advanced communication and I/O protocols, high-level PASCAL-based language, powerful new virtual systems, and advanced concepts in micro-processor-based terminals.

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- Data Base Design
- Performance Measurement & Analysis
- Configuration Management
- File Access Methods
- Operating System Development
- Compiler Design/Development
- Firmware Development
- Diagnostic Programming
- Test Systems Development
- MICR Proof Of Deposit Software
- Systems Architecture
- Tools Support
 - time-sharing
 - compiler designs/developments (high level block structured languages)
 - SW tools design

Immediate Openings — Hardware areas:

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- MICR/OCR/OMR Engineering
- Memory Device Engineering
- Logic Design Engineering
- Systems Architecture
- I/O Subsystem Configuration
- Systems Integration Test
- Product Engineering—Mechanical, Optical, Electrical

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- PROGRAMMING
- TECHNICAL CUSTOMER SERVICE/COORDINATION
- SYSTEMS ANALYSTS

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Director, International Sales

The job: Leading marketing and sales effort in the promotional development of the Applicon product line overseas. Major emphasis: supervision of all sales and field systems engineering activities.

The requirements: A strong background in capital equipment sales in European markets.

Manager, Training and Documentation

The job: Directing a staff of instructors in Sales Training, Customer Training and In-House Technical training as well as a staff concerned with product/application documentation for internal and promotional use.

The requirements: 3-5 years minimum experience in training and curriculum development, (sales training experience desired) along with 2-4 years electronic industry technical/marketing related experience.

Instructors

The job: Customer and software training as it relates to Applicon System use.

The requirements: 1-3 years minimum experience as an instructor preferably in the computer industry.

Marketing Manager, Architecture/Engineering

The job: Managing the marketing effort from initial analysis through all promotional activities for all products relating to architectural, engineering and drafting markets.

The requirements: A marketing-sales background in structural, piping or general drafting industries with the desire and flair to grow in a stimulating marketing environment.

Marketing Specialist, CAM

The job: Analyzing, defining and planning requirements for the manufacturing segment of the Metal Workings Industry.

The requirements: 2-4 years experience minimum including experience with the APT language in support of N/C programming or marketing experience aimed at N/C and CAM markets.

Marketing Specialist, IC/PCB

The job: Analyzing, defining and planning of requirements in IC/PCB markets.

The requirements: 2-4 years experience in the IC/PCB industries or technical design (preferably computer aided) in IC's or PCB's. Or, marketing/sales experience with a strong desire and flair for work in a brisk marketing environment.

Designers: Mechanical, IC, PCB, Drafting

The job: Positions available throughout the U.S. to work in support of sales as the technical liaison to customers during pre- and post-sale activity.

The requirements: Preferably, 1-3 years design experience on computerized graphic equipment.

Sales Persons

The job: Selling in one of a number of U.S. markets, including: Los Angeles, Pittsburgh, Boston, Hartford and the Midwest.

The requirements: A record of accomplishment in capital equipment sales is preferred.

Customer Services

The job: Performing preventive and remedial maintenance on Applicon graphic systems nationally. Specific locations include: Eastern

Massachusetts, Connecticut, Pennsylvania/New Jersey, Midwest and Wichita.

The requirements: 1-3 years minimum experience preferably in trouble-shooting PDP 11 or similar CPU's as well as standard peripheral items.

Advertising and Promotional Specialist

The job: Translating complex technical subject matter into clean, crisp promotional material and directing a full range of promotional efforts including brochures, publicity, advertising, A-V aids and trade shows.

The requirements: 3-5 years experience in the promotion of EDP systems.

Tech Writers

The job: Working with product specifications and design engineers to produce hardware and software manuals.

The requirements: Excellent writing and editorial skills, superb organizational abilities and an ability to work within deadlines.

ENGINEERING POSITIONS

Engineering Manager, Software Product Development

The job: Managing and directing the efforts of a team of engineers in the design, development, and support of software products.

The requirements: A minimum of 5-8 years strong management experience in the computer industry with a record of high achievement and leadership in a high pressure, deadline oriented environment.

Engineering Manager, CAD/CAM

The job: Managing and directing the efforts of a team of engineers in the design and development of a variety of CAD/CAM applications. You'll interface heavily with the marketing organization in leading this activity.

The requirements: A minimum of 5-8 years technical management experience with an emphasis on computer-aided design and computer-aided manufacturing including knowledge of APT programming and numerical control applications.

Application Programmers, CAD/CAM

The job: Designing, coding, testing and documenting a variety of CAD/CAM applications for mini-computer interactive graphic systems.

The requirements: Minimum of 2-4 years applications experience in the areas of design or manufacturing technology.

Group Leader, Numerical Control Applications

The job: Designing, developing and implementing numerical control applications for

mini-computer interactive graphics systems.

The requirements: Preferably, leadership or supervisory experience with a knowledge of assembly languages. You provide the N/C expertise; we'll supply the graphics.

Applications Programmers, Special Products

The job: Specify, design and develop special software products for specific customer requirements.

The requirements: A minimum of 2-4 years experience in electronics applications programming preferring knowledge of 2D/3D design techniques and an ability to deal with customers on a variety of short-term projects.

Applications Programmers, IC/PCB

The job: Designing, coding, testing and documenting a number of different applications for the IC and PCB industries.

The requirements: A minimum of 2-4 years applications experience associated with the design/development of integrated circuitry, printed circuit boards or hybrids.

Systems Programmers, RSX 11/Communications

The job: Participating in various facets of development and integration of the Applicon Graphics System with Digital's RSX 11M operating system to multiple processor systems with communications and shared memory interfaces.

The requirements: Systems programming experience involving RSX 11M operating systems and/or a background in major communication protocols is preferred.

Graphic Data Base Management

The job: Managing the graphics data base to include definition, translation and processing through to multiple processing systems.

The requirements: Preferably, experience managing a mini-computer/high performance data base. A math background desirable.

Product Development Engineer

The job: Working as an important part of the hardware support/design team. You'll design, re-design and follow up engineering of products through the manufacturing process.

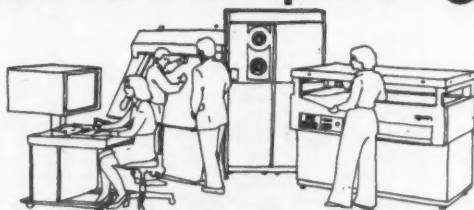
The requirements: Minimum of 2-4 years experience related to mini-computer and/or micro-computer systems. BSEE preferred.

Electrical Engineer, Color Plotter

The job: You'll design and be responsible for new design project efforts while lending engineering support for existing products related to our new color graphics plotting system.

The requirements: Preferably, a BSEE with experience in mini-computers (PDP 11 desired). Recent involvement in micro processor or system design is also desirable as is interface design experience.

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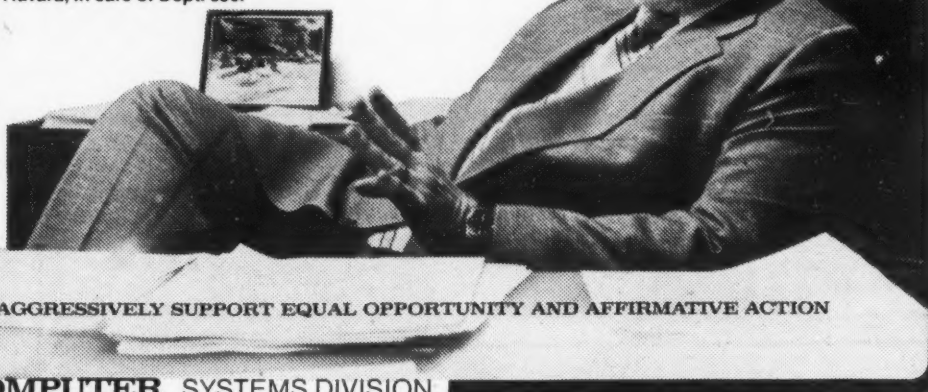
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“Mixed degrees are a special asset here... mixed BS, MS, and PhD's in EE and Computer Sciences. Another important need—people who know minicomputers — who are essentially hardware/software systems architects in mini's, but within the communications environment. They should be able to provide optimum hardware/software architectural solutions to complicated requirements. We also need message switching architects, computer benchmark experts, digital circuit designers, computer network performance modelers, and distributed data base/software designers.”

If you'd like to chat further with CSC Technical Director Lynn Hopewell, he will welcome your call on (800) 336-0429, or telephone him collect at (703) 533-8877.

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Send resume or SF-171 to:

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Experience in selling account and management information systems, applications software very desirable.

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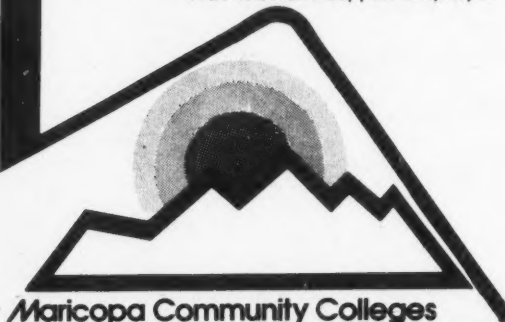
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Maricopa Community Colleges

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Southern California Location

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For confidential review, send your resume, including salary history to:

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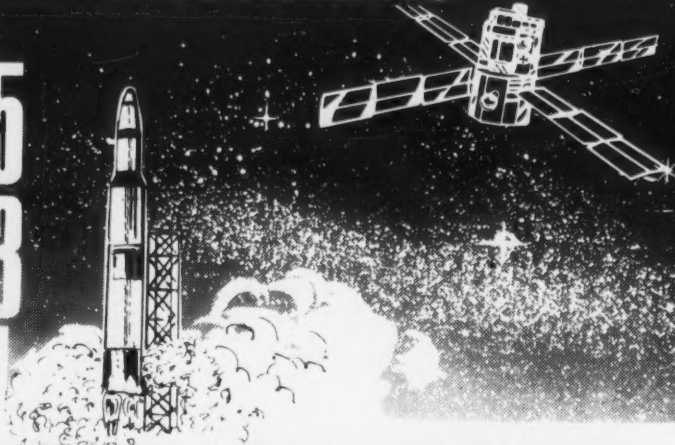
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PRINTRONIX

PROGRAMMER/ANALYSTS

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21



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The University of Pittsburgh at Johnstown announces a faculty opening in Mathematical and Computing Sciences at the Assistant or Associate Professor level. Available January 1, 1979. Applicants should have a background in applied mathematics and computing sciences and demonstrate continued commitment to professional development and undergraduate teaching. Salary negotiable depending on experience and academic qualifications.

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OS DESIGN: Data comm, user packages, DEC, HP, DG To 25k

SOFT Specialist: Assembly, PDP11, customer interface To 24k

Contact: Data Processing Dept.
C/M of Orlando 3101 Maguire
Orlando, Florida 32803
(305) 894-6551

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We are a Phoenix based food service company with immediate openings for Senior Programmer Analysts. We are looking for people who have experience working in the food service industry. You should have experience on an IBM system working under OS, a minimum of 3 years ANS COBOL is required. Exposure to data base design (TOTAL), on line systems (ENVIRON 1), TSO, MVS, JES 2, and WYLBUR is desired. In addition, we will be installing an IBM 370-3033 this year.

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Director of Personnel
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228 Liberty Plaza
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SYSTEMS PROGRAMMERS

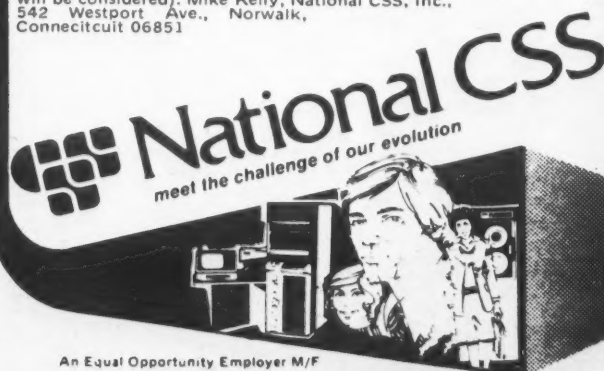
National CSS is an established leader in the computer services industry. Our time sharing hardware is powered by our superior operating system, VP/CSS. These host computers are interconnected by our own extensive communications facilities, including a 35-node nationwide packet switching network. We recently announced a mini computer with software more potent and flexible than any hardware at twice the cost.

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Minimum 2 years Schottky TTL experience to handle Project Level digital hardware design with microprocessor experience preferred.

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Develop test processes and equipment using mini-computer based systems requiring background of BSEE plus minimum 2 years experience in design or test engineering.

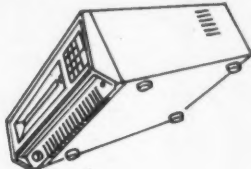
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Analyst

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Director, Manpower Planning

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Requires a minimum of 2 years Honeywell 6000 experience, and knowledge of 6000 JCL and COBOL programming. You must be able to recognize specific training needs, both in operations and in programming areas, and develop courses to meet the established needs. You must be willing to teach approximately 70-days per year, in both classroom and small group situations, and must have strong interpersonal skills and a commitment to the educational process. Salary to low \$20's.

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call Al Sack (collect) at (714) 833-2400, Ext. 336,
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An important subsidiary of a leading toy manufacturer, seeks a qualified programmer/analyst for this rewarding position. You will report directly to the Manager-MIS and be responsible for analysis, programming, testing, implementation, and documentation for a variety of assignments. Central New Jersey location.

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North, South, East, or West—wherever you want to live Control Data has exciting career opportunities for computer professionals. As an industry leader we can offer you the career and living environment you choose. Immediate openings exist in the following specialties:

HARDWARE: Engineers with experience in any of the following technologies: Logic design, power systems, inkjet, electric and water utility, thin film circuits, design and development of disk and tape drives. Positions also exist for microprogrammers, metallurgists and individuals with reliability and radio frequency experience.

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To find out more details about YOUR opportunities submit your resume, a letter summarizing your qualifications, or this coupon to J.W. Lewis, Control Data Corporation, P.O. Box 0 (HQN03T), Minneapolis, MN 55440. You are assured of a personal, confidential reply. You may also call TOLL FREE 24 hours a day (1-800-821-7700 extension 608).

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Division of the Breen Group, Inc.

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Position requires 2 years experience in CICS internals and TP access method to work on 850 terminal (SNA) system. Knowledge of TP hardware (Modems, terminals, IBM 3705 and telephone line will be helpful. (Section 356).

MVS Systems Programmer

Position involves support of JES 2 and/or various program products such as ANS COBOL REL2, FORTRAN II and G1, PL 1, etc. Candidate must be knowledgeable in JES2 internals, have experience in installation maintenance and user support of program products. Consideration will be given to individuals with knowledge of ASP/JES3 internals. (Section 357).

Data Base Analysts

One position specializes in the data base area of a new customer accounting system, principally concerned with data base integrity, control, archival, and performance issues. Position requires at least 3 years experience with large data bases. One year of VSAM experience is also required while knowledge of VSAM internals is desirable. Additionally, at least 2 years of recent COBOL and TSO experience is required. (Section 358).

A second position is open in the support of IMS data bases to be designed for a new, large Continuing Property Records System. Activities are centered around design, integrity, control and performance. Position requires a minimum of 5 years experience in designing large applications for IBM 370, with recent VSAM, IMS and TSO experience. (Section 359).

Cobol Programmers

Positions require a minimum of 2 years experience as a programmer on IBM 360/370 OS environment using ANS COBOL. Positions are available to participate in the enhancement of new and existing customer accounting and financial systems as well as a variety of business applications. Structured programming experience is preferred. TSO and degree desired. (Section 360).

CICS Programmer

Positions require a minimum of 2 years experience as a programmer on IBM 360/370 OS environment using CICS/VS and ANS COBOL. Experience with CICS/VS 1.3 high-level language programming interface is preferred. Successful candidates will be involved in the development and/or maintenance of several large scale on-line systems. Knowledge of JCL, VSAM desired. (Section 361).

System Designer/Analyst

Positions require knowledge of structured systems development techniques with minimum one year experience using formal structured design techniques such as ORR, Jackson or Yourdon. Designer/Analyst will participate in the development of financial systems, such as Income Tax Information Systems or a new customer accounting system; a project leader is needed for a new material management system. All of these positions include analysis, design, programming, testing and implementation. (Section 362).

Programmer/Analyst

Position requires a degree in Mathematics, Engineering, Computer Science or equivalent with 2 to 3 years programming experience. Knowledge of FORTRAN is required and knowledge of PL/1, JCL, TSO and FR-80 desirable. Responsibilities will include system and application support of a mini-based interactive graphics system, and the design, programming and implementation of data base surveying and microfilm systems on an IBM 370/168. (Section 363).

These positions include a comprehensive benefits package and salary commensurate with your experience and ability. For immediate consideration, please submit your resume including salary history and requirements to Professional Recruitment. (Reference Section Number). No agencies please, principals only.

Southern California Edison

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Coordinate user support within a group of Bell companies. Must have leadership qualities plus heavy T/S experience. Positions are available in the New York/New Jersey area, in California, and in Georgia.

Bell Account Representatives

Will support users within the Bell System. Should have 1-2 years of T/S experience and an applicable college degree. Familiarity with the Bell System is a plus. Openings in Denver, New York/New Jersey, California, and Georgia.

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Account Representatives -- Junior through Senior

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Will work with the Systems Group developing and maintaining software for a multi-user, multi-programming system. Areas include real-time, scheduling, file management, interactive communications, language processors, etc. Varying degrees of experience will be considered. This position is available at the Denver headquarters.

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Positions are now available for MIS Analysts in the areas of Medical Research, Pharmacy, Laboratory, Nursing, Admitting, Radiology and Discharge Information Systems. Responsibilities include implementing and developing new medical systems and maintaining integrity of present systems.

Degree in Computer Sciences, Engineering or Business, 3 years experience in Systems Analysis desired. Statistical analysis, Programming and previous hospital experience preferred.

Excellent career opportunity.

Please send resume including education, experience and salary requirements to: Dale Harper, Personnel Services, Methodist Hospital, 1812 N. Capitol, Indianapolis, Indiana 46202, (317) 924-8931. Equal Opportunity Employer

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Plan for, budget, lead and direct operations of large multiple main frame computer systems. Schedule business data processing, production control and quality assurance. Service both academic and administrative users. Must have basic telecommunications experience.

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Direct large scale projects. Technical ability in design, program specifications, systems testing and translation of requirements to detail specifications. Higher education experience and user interface skills required.

SYSTEMS ANALYSTS, GENERAL LEDGER

4 to 6 years, (inc. COBOL Prog.) in university fund accounting G/L experience. Technical ability in Design, Implementation, Installation and Completion of systems.

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**SYSTEMS & COMPUTER
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Mr. Bruce Alexander
YOURDON inc.
1133 Avenue of the Americas
New York, New York 10036

Small Systems Software Development

We are a key software development group which provides primary support for all of Digital's small systems development activities. Currently, we have several openings in the following areas:

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We're looking for several self-starters with the capability and desire to impact our operating systems development group.

The computer is the PDP-11 and the operating system is RT-11. Ideally, you will have had experience in the above, but you must have a minimum of 1-2 years assembly language experience on minicomputers, preferably coupled with a BSCS/MSCS or equivalent.

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We are looking for senior people to participate in design, implementation, support, and evaluation of languages. Our main requirements are strong interest in compilers and experience in identifying language user needs. Compiler experience working in a high level implementation language such as PASCAL or PL/1 is required.

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This position requires a broad background in Software Engineering. Requirements include an in-depth knowledge of structural programming; microprocessor based systems; compiler development and implementation; and the design of interpretative machines.

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We offer an attractive benefits package and salary commensurate with experience. If you would like to join our progressive company, please send your resume, including salary history, or call collect to Jackie A. Cockreham, Personnel Services Manager.



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Analyze, design and implement financial/accounting computer systems and programs. Requires 3 or more years systems analyst experience with in-depth experience with at least one of the following: general ledger, A/P, A/R, retail accounting, payroll or financial analysis. Knowledge of COBOL and experience in OS/VS and JCL necessary, with Mini-computer and distributed processing experience highly desirable.

PROGRAMMER/ANALYST

Assist in the analysis, development and implementation of various business systems and programs. Requires COBOL, OS/VS JCL and IBM access methods and a working knowledge of financial accounting and product movement systems.



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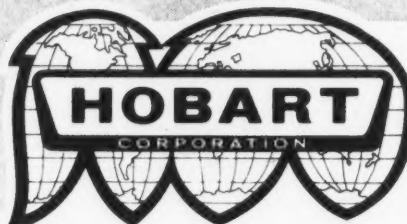
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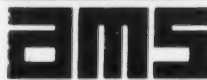
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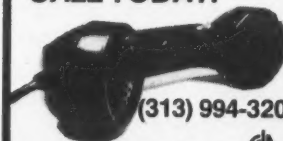
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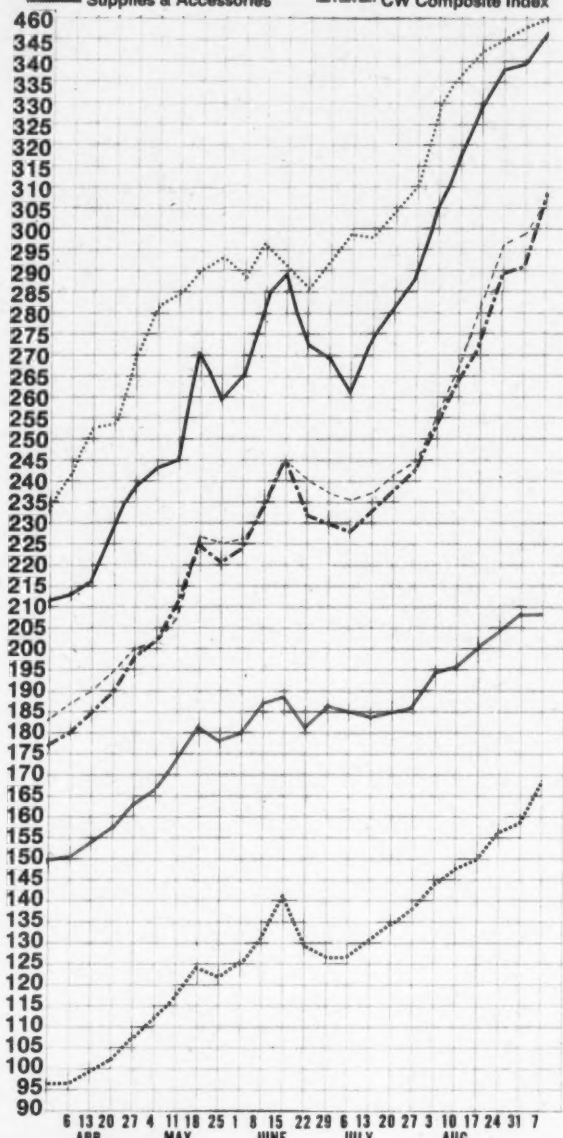
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Earnings Reports

| MEMOREX Three Months Ended June 30 | | | |
|---------------------------------------|-------------|-------------|--|
| | 1978 | a1977 | |
| Shr Ernd | \$1.98 | \$2.06 | |
| Revenue | 158,508,000 | 108,182,000 | |
| Tax Cred | 3,270,000 | 5,105,000 | |
| Earnings | 13,514,000 | 12,966,000 | |
| 6 Mo Shr | 4.04 | 4.27 | |
| Revenue | 297,370,000 | 211,938,000 | |
| Tax Cred | 8,249,000 | 10,526,000 | |
| Earnings | 27,875,000 | 26,618,000 | |

a-Restated

| DIGILOG SYSTEMS Three Months Ended June 30 | | | |
|---|-----------|-----------|--|
| | 1978 | 1977 | |
| Shr Ernd | \$0.06 | \$0.28 | |
| Revenue | 1,081,652 | 1,158,547 | |
| Tax Cred | 215 | 96,883 | |
| Earnings | 45,934 | 187,258 | |
| 9 Mo Shr | .54 | .64 | |
| Revenue | 3,670,698 | 2,911,134 | |
| Tax Cred | 119,159 | 202,579 | |
| Earnings | 397,982 | 435,582 | |

| HONEYWELL Three Months Ended June 30 | | | |
|---|-----------|-----------|--|
| | 1978 | 1977 | |
| Shr Ernd | \$2.06 | \$1.41 | |
| Revenue | 861,215 | 705,185 | |
| Tax Cred | 2,250 | 2,434 | |
| Earnings | 44,016 | 29,634 | |
| 6 Mo Shr | 3.72 | 2.88 | |
| Revenue | 1,649,987 | 1,367,953 | |
| Tax Cred | 3,853 | 6,414 | |
| Earnings | 79,391 | 60,492 | |

| INFORMATION MAGNETICS 13 Weeks Ended July 1 | | | |
|--|------------|------------|--|
| | 1978 | a1977 | |
| Shr Ernd | \$0.01 | \$0.20 | |
| Revenue | 8,152,000 | 8,507,000 | |
| Disc Op Loss | 620,000 | 153,000 | |
| Earnings | 29,000 | 379,000 | |
| 26 Weeks Shr | .03 | .41 | |
| Revenue | 15,254,000 | 16,048,000 | |
| Earnings | 86,000 | 778,000 | |

a-Restated to reflect discontinued operations.
 b-From disposal of discontinued operations.

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 Roy Einreinhofer
 Advertising Administrator
 Terry Williams
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 Crows Nest, NSW 2065
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 Telex: SECCO AA25468

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 6, 1978

All statistics compiled,
 computed and formatted by
 TRADE QUOTES, INC.
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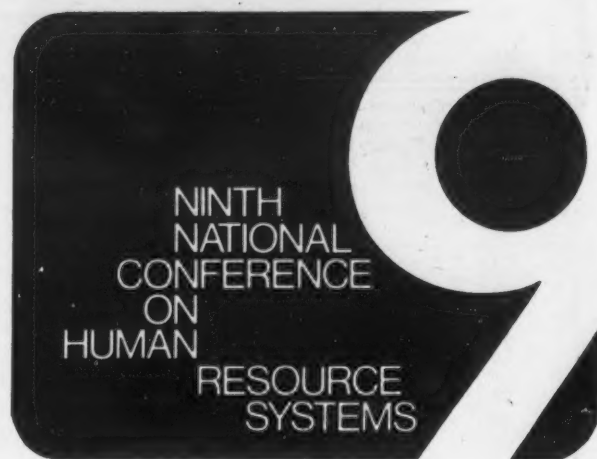
| S X C H | PRICE | | | | | E X C H | PRICE | | | | | E X C H | PRICE | | | | |
|-------------------------|----------------------|-------------------------|----------------------|----------------------|--|--------------------------|----------------------|-------------------------|----------------------|----------------------|--|------------------------|----------------------|-------------------------|----------------------|----------------------|--|
| | 1978 RANGE (1) | CLOSE SEPT 6 1978 | WEEK NET CHNGE | WEEK PCT CHNGE | | | 1978 RANGE (1) | CLOSE SEPT 6 1978 | WEEK NET CHNGE | WEEK PCT CHNGE | | | 1978 RANGE (1) | CLOSE SEPT 6 1978 | WEEK NET CHNGE | WEEK PCT CHNGE | |
| COMPUTER SYSTEMS | | | | | | | | | | | | | | | | | |
| A ANDAHIL CORP | 20-69 | 59 1/4 | -5 7/8 | -9.0 | | O ADVANCED COMP TECH | 1-2 | 1 7/8 | +1/8 | +7.1 | | O DATA ACCESS SYSTEMS | 3-12 | 14 1/4 | +2 3/4 | +23.6 | |
| N BIRKHOUGHS CORP | 59-87 | 86 7/8 | +2 7/8 | +3.4 | | O ANACORP INC | 8-22 | 14 | 0 | 0.0 | | O DATA 100 | 9-20 | 19 1/4 | -1/4 | -1.2 | |
| C COMPUTER AUTOMATION | 23-44 | 35 1/4 | -1/4 | -0.7 | | A APPLIED DATA RES. | 8-17 | 15 7/8 | 0 | 0.0 | | A DATA PRODUCTS CORP | 15-25 | 23 7/8 | +7/8 | +3.8 | |
| N CONTROL DATA CORP | 23-43 | 42 7/8 | +1 7/8 | +4.5 | | N AUTOMATIC DATA PROC | 24-36 | 33 5/8 | +2 1/8 | +6.7 | | O DATUM INC | 2-6 | 5 1/2 | +1 | +22.2 | |
| O CRAY RESEARCH INC | 21-74 | 73 1/2 | +6 1/2 | +9.7 | | O COLEMAN AMERICAN COS | 1-2 | 1 7/8 | +1/8 | +7.1 | | O DECISION DATA COMPUT | 2-6 | 5 1/2 | +3/4 | +15.7 | |
| N DATA GENERAL CORP | 42-68 | 66 1/2 | +2 3/4 | +4.3 | | O COMPU-SERV NETWORK | 7-12 | 7 3/4 | 0 | 0.0 | | O DELTA DATA SYSTEMS | 1-1 | 5/8 | +1/8 | +25.0 | |
| N DATAPoint CORP | 34-75 | 74 1/2 | +4 7/8 | +7.0 | | O COMPUTER HORIZONS | 1-9 | 9 | +1/2 | +5.8 | | A EDUCATION INC | 6-30 | 30 | +3/8 | +1.2 | |
| N DIGITAL EQUIPMENT | 39-54 | 53 1/8 | +3 3/8 | +6.7 | | C COMPUTER NETWORK | 8-16 | 14 1/4 | -1/4 | -1.7 | | O DATARAM CORP | 6-24 | 20 3/4 | +1 3/4 | +9.2 | |
| N ELECTRONIC ASSOC. | 2-13 | 11 7/8 | +1 5/8 | +15.8 | | N COMPUTER SCIENCES | 8-17 | 15 7/8 | -7/8 | -5.2 | | N ELECTRONIC M & M | 4-9 | 7 7/8 | +3/8 | +5.0 | |
| A ELECTRONIC ENGINEER. | 11-19 | 13 7/8 | +1 1/4 | +9.9 | | O COMPUTER TASK GROUP | 1-4 | 3 1/4 | 0 | 0.0 | | O FABRI-TEK | 1-2 | 1 7/8 | +1/8 | +11.0 | |
| C FOUR-PHASE SYSTEMS | 19-42 | 42 | +3 1/4 | +8.3 | | O COMPUTER USAGE | 2-4 | 4 1/8 | +1/2 | +13.7 | | O GENERAL COMPUTER SYS | 1-3 | 2 1/4 | -1/8 | -5.2 | |
| N FOXBORO | 28-40 | 38 1/4 | +3/4 | +2.0 | | O COMSHARE | 6-19 | 18 3/4 | +1/4 | +1.3 | | N HAZELTINE CORP | 10-17 | 16 5/8 | +1/8 | +0.7 | |
| O GENERAL AUTOMATION | 7-26 | 25 1/4 | -1/2 | -1.9 | | O DATA DIMENSIONS INC | 4-9 | 7 3/4 | -1/8 | -1.5 | | N HARRIS CORP | 40-71 | 68 5/8 | +7/8 | +1.2 | |
| O GRI COMPUTER CORP | 1-2 | 1 1/2 | -1/8 | -7.6 | | N DATATAB | 1-2 | 1 1/2 | +1/4 | +20.0 | | O INFREX INC | 6-10 | 10 | +1 3/8 | +15.6 | |
| N HEWLETT-PACKARD CO | 62-51 | 90 3/4 | +3 1/4 | +3.7 | | N ELECTRONIC DATA SYS. | 15-25 | 24 3/8 | +7/8 | +3.7 | | O INFORMATION INTL INC | 8-12 | 10 | 0 | 0.0 | |
| N HONEYWELL INC | 43-72 | 71 5/8 | +3 5/8 | +5.3 | | O INSYTE CORP | 1-2 | 2 5/8 | +1/8 | +5.0 | | O INTEL CORP | 39-62 | 58 1/2 | +3 1/2 | +6.3 | |
| N IBM | 236-301 | 300 | +7 | +2.3 | | O IPS COMPUTER MARKET. | 2-3 | 3 1/4 | 0 | 0.0 | | A LUNDY ELECTRONICS | 4-6 | 7 | +1 1/8 | +19.1 | |
| O MANAGEMENT ASSIST | 9-29 | 28 3/8 | +3 | +11.8 | | O KEANE ASSOCIATES | 3-6 | 6 1/8 | +1/4 | +4.2 | | O MSI DATA CORP | 12-19 | 17 1/4 | +1/8 | +0.7 | |
| O MICRODATA CORP | 10-23 | 23 | +1 1/2 | +6.6 | | O KEYDATA CORP | 1-3 | 2 1/8 | 0 | 0.0 | | N MEMOREX | 27-58 | 56 1/4 | +7/8 | +1.5 | |
| O PENTI-COMPUTER SYST | 5-8 | 6 1/2 | 0 | 0.0 | | A LOGICON | 11-19 | 18 1/2 | -1/8 | -0.6 | | N MONARK DATA SCI | 6-15 | 12 7/8 | +1/4 | +1.9 | |
| SOFTWARE & ECP SERVICES | | | | | | | | | | | | | | | | | |
| C MODULAR COMPUTER SYS | 7-17 | 16 3/8 | +3/8 | +2.3 | | A MANAGEMENT DATA | 1-1 | 7/8 | 0 | 0.0 | | O DMEX | 2-2 | 2 1/2 | +1/2 | +25.0 | |
| N NCR | 37-67 | 66 7/8 | +4 3/8 | +7.0 | | A NATIONAL CSS INC | 15-36 | 33 7/8 | -1/8 | -0.3 | | O PENRIL CORP | 5-12 | 10 3/8 | +1/2 | +5.0 | |
| N PRIME COMPUTER INC | 20-43 | 40 3/4 | +2 1/4 | +5.8 | | O NATIONAL DATA CORP | 7-13 | 12 1/2 | -1/4 | -1.9 | | N PERTEC CORP | 9-15 | 14 5/8 | +3/4 | +5.4 | |
| N PERKIN-ELMER | 17-28 | 27 7/8 | +2 1/8 | +8.2 | | A ON LINE SYSTEMS INC | 17-30 | 29 | -3/4 | -2.5 | | A POTTER INSTRUMENT | 2-2 | 1 3/4 | 0 | 0.0 | |
| N RAYTHEON CO | 29-58 | 54 1/4 | +2 1/4 | +4.3 | | N PLANNING RESEARCH | 4-10 | 9 3/4 | +7/8 | +9.8 | | O QUANTOR CORP | 2-5 | 2 5/8 | +1/8 | +5.0 | |
| N SPERRY RAND | 33-49 | 47 3/8 | +1/2 | +1.0 | | O PROGRAMMING & SYS | 1-1 | 1 | 0 | 0.0 | | O RECOGNITION EQUIP | 7-13 | 12 | -1/4 | -2.0 | |
| A SYSTEMS ENG. LABS | 11-22 | 20 3/4 | +1/4 | +1.2 | | O RAPIDATA INC | 3-7 | 6 7/8 | +1/8 | +1.8 | | O SCAN DATA | 1-5 | 3 5/8 | - | -1.6 | |
| A WANG LABS. | 12-32 | 31 3/8 | +1 5/8 | +5.4 | | O REYNOLDS & REYNOLD | 18-36 | 32 1/4 | +3 1/4 | +11.2 | | N STORAGE TECHNOLOGY | 19-46 | 34 5/8 | +7/8 | +2.5 | |
| LEASING COMPANIES | | | | | | | | | | | | | | | | | |
| O BOOTH COURTIER CORP | 13-18 | 17 1/2 | +1 3/8 | +8.5 | | O SCIENTIFIC COMPUTERS | 3-8 | 8 | +1/8 | +1.5 | | O T BAR INC | 11-20 | 19 1/4 | -1/4 | -1.2 | |
| O COMDISCO INC | 5-17 | 16 | +1 1/4 | +8.4 | | O TMSHARE INC | 18-33 | 31 1/2 | -1/2 | -1.5 | | A TEC INC | 4-9 | 7 7/8 | -1/8 | -1.5 | |
| A COMPERCE GROUP CORP | 1-1 | 5/8 | 0 | 0.0 | | A URS SYSTEMS | 5-7 | 7 | +1/4 | +3.7 | | A TEC INC | 4-13 | 12 3/4 | +1 | +8.5 | |
| A COMPUTER INVSYS GRP | 1-7 | 5 1/2 | +1 | +22.2 | | N WVLV CORP | 1-7 | 6 1/4 | 0 | 0.0 | | N TEKTRONIX INC | 33-46 | 43 3/4 | +3/8 | +0.8 | |
| N DATRONIC RENTAL | 1-2 | 1 3/4 | +1/4 | +16.6 | | PERIPHERALS & SUBSYSTEMS | | | | | | | | | | | |
| A DCL INC | 3-5 | 4 1/2 | +1/2 | +12.5 | | N ADDRESSOGRAPH-MULT | 14-32 | 31 1/2 | +2 1/2 | +8.6 | | A AMERICAN BUS PRODS | 6-10 | 10 | -1/8 | -1.2 | |
| N DPF INC | 8-14 | 12 3/8 | +1/8 | +1.0 | | O ADVANCED MEMORY SYS | 7-18 | 17 5/8 | +5/8 | +3.6 | | O BALTIMORE BUS FORMS | 2-5 | 2 3/4 | -3/4 | -21.4 | |
| N ITTEL | 16-35 | 34 3/8 | +1 5/8 | +4.9 | | N AMPER CORP | 10-19 | 19 1/4 | +1 1/8 | +6.2 | | A BARRY WRIGHT | 14-28 | 26 | -5/8 | -2.3 | |
| N LEASCO CORP | 24-36 | 33 5/8 | -1 3/8 | -3.9 | | O ANDERSON JACOBSON | 5-10 | 9 | 0 | 0.0 | | O CYBERMATICS INC | 1-1 | 1 1/4 | 0 | 0.0 | |
| O LEASPC CORP | 1-4 | 2 7/8 | -1/8 | -4.1 | | N APPLIED DIG DATA SYS | 13-21 | 20 1/2 | +1/2 | +2.5 | | O DUPLEX PRODUCTS INC | 18-30 | 30 1/4 | +1 1/8 | +3.8 | |
| A PIONEER TEX CORP | 5-7 | 5 7/8 | -1/8 | -2.0 | | O BEEHIVE INT'L | 4-7 | 6 3/4 | +1/2 | +14.8 | | A ENNIS BUS. FORMS | 8-17 | 13 3/8 | 0 | 0.0 | |
| N U.S. LEASING | 13-20 | 19 5/8 | +1/4 | +1.2 | | A BOLT, BERANEK & NEW | 6-11 | 10 | +3/8 | +3.8 | | N 3M COMPANY | 43-65 | 63 7/8 | +1 1/2 | +2.4 | |
| SUPPLIES & ACCESSORIES | | | | | | | | | | | | | | | | | |
| O BOOTH COURTIER CORP | 13-18 | 17 1/2 | +1 3/8 | +8.5 | | N BUNKER-RAND | 10-19 | 19 1/8 | +3/8 | +2.0 | | O MOORE CORP LTD | 26-34 | 30 1/2 | +1/2 | +1.6 | |
| O COMDISCO INC | 5-17 | 16 | +1 1/4 | +8.4 | | A CALCOMP | 3-13 | 13 | +2 1/2 | +23.8 | | N NASHUA CORP | 18-36 | 35 1/2 | +1 1/2 | +4.4 | |
| A COMPERCE GROUP CORP | 1-1 | 5/8 | 0 | 0.0 | | O CARTRIDGE MEMORIES | 3-9 | 7 3/4 | -3/8 | -4.6 | | O STANDARD REGISTER | 20-27 | 26 1/2 | +3/4 | +2.9 | |
| A COMPUTER INVSYS GRP | 1-7 | 5 1/2 | +1 | +22.2 | | N CENTRONICS DATA COMP | 16-35 | 32 1/2 | -3/4 | -2.2 | | A TAB PRODUCTS CO | 8-16 | 15 1/2 | -1/2 | -3.1 | |
| N DATRONIC RENTAL | 1-2 | 1 3/4 | +1/4 | +16.6 | | O COGNITRONICS | 1-4 | 2 1/2 | +1/2 | +25.0 | | A UARCO | 19-27 | 26 1/8 | +5/8 | +2.4 | |
| A DCL INC | 3-5 | 4 1/2 | +1/2 | +12.5 | | C COMPUTER COMMUN. | 6-12 | 12 | +3/8 | +3.2 | | O WABASH MAGNETICS | 10-22 | 22 3/8 | +1 5/8 | +7.8 | |
| N DPF INC | 8-14 | 12 3/8 | +1/8 | +1.0 | | O COMPUTER CONSOLES | 4-10 | 8 3/4 | -1/4 | -2.7 | | N WALLACE BUS FORMS | 18-32 | 31 | 0 | 0.0 | |
| N ITTEL | 16-35 | 34 3/8 | +1 5/8 | +4.9 | | A COMPUTER EQUIPMENT | 3-6 | 5 1/2 | -1/8 | -2.2 | | | | | | | |
| N LEASCO CORP | 24-36 | 33 5/8 | -1 3/8 | -3.9 | | C COMPUTER TRANSCIVER | 1-2 | 2 | +1/8 | +6.6 | | | | | | | |
| O LEASPC CORP | 1-4 | 2 7/8 | -1/8 | -4.1 | | O COMTEK | 9-38 | 36 1/2 | +2 1/2 | +7.3 | | | | | | | |
| A PIONEER TEX CORP | 5-7 | 5 7/8 | -1/8 | -2.0 | | N CONRAC CORP | 19-26 | 23 1/4 | +5/8 | +2.7 | | | | | | | |
| N U.S. LEASING | 13-20 | 19 5/8 | +1/4 | +1.2 | | | | | | | | | | | | | |

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Wednesday, October 25
Thursday, October 26
Place: Hyatt Regency
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Leading policymakers, executives, professionals and "working experts" will make major presentations - consult - conduct workshop sessions. People like Senator Harrison A. Williams, Jr., Weldon Rougeau, Donn B. Parker, Harry McPherson, Harold E. Krents, Edgar D. Mitchell and Jack Hight. It's a unique opportunity to "rub elbows," stay in touch, share thoughts and experiences, exchange views, absorb information, get *new ideas*.

Tuesday, October 24

7:30-9:00 a.m. - Registration

9:00-9:45 a.m.

"Changing Patterns in the Human Resource Industry"
Jack Hight, President
Information Science Incorporated

9:45-10:00 a.m.

Welcome to the City of Dallas

10:00-11:00 a.m.

Washington's View of the Human Resource Industry
Harrison A. Williams, Jr.,
U.S. Senator, New Jersey,
Chairman, Senate Human Resources Committee

11:00-11:30 a.m.

Equal Employment Opportunity -
The Road Ahead
Weldon Rougeau, Director,
Office of Federal Contract
Compliance Programs

11:30-12:00 noon

Crime by Computer
Donn B. Parker,
Senior Management Systems
Consultant, SRI International

12:00-2:00 p.m.

Luncheon
Washington Today
Harry McPherson, Partner,
Verner, Liplert, Bernard
and McPherson

2:00-5:15 p.m.

Concurrent Workshop Sessions
(Each given in 2:00-3:30 p.m. and
3:45-5:15 p.m. sessions.)

Politics of Human Resource System Implementation - Revisited

Data Analyzer Applications

INFONET and HRS - Personnel Management Needs in an
Interactive Network

New Developments Affecting Federal Contractors

EEO Systems Application and Performance

Systems Design Considerations for Personnel Applications

Implementing a Payroll System

Human Resources Accounting vs. Cost Accounting

OSHA: Regulatory Trends and Prospects

Skills Profiling and Career Management

5:30-7:30 p.m.

Reception - Cocktails, Music, Hors d'oeuvres

Wednesday, October 25

9:00-11:15 a.m.

"The Challenges of Human Resource Management in the 1980's"
Panel Moderator: Edgar D. Mitchell,
Special Consultant to the Chairman of the Board,
Information Science Incorporated, Apollo X:V Astronaut

Computer Systems of the 1980's

Charles Lecht, President, Advanced Computer Techniques.

11:15-12:45 p.m.

Concurrent Workshop Sessions

Health Safety System Case Study: General Electric

IMS Personnel/Payroll System Development

Are Privacy and Human Resources Management Compatible?

Security Considerations of a Personnel Data System

Employment Selection Systems

System Upgrading Considerations

Canadian Payroll Processing

The InSci/80 Mini Computer-Based Personnel Information System -
A One-Year User Perspective

12:45-2:00 p.m.

Luncheon

2:00-5:15 p.m.

Concurrent Workshop Sessions
(given in each of two sessions)

Data Analyzer - On-Line

The Privacy Issue Reconsidered

Developing a Corporate EEO Strategy

Motivation, Performance and Careers

Personnel Systems in Real Time - A Remote Service

Payroll/Personnel Conversion in a Major Bank

The Personnel System in a Highly Decentralized Industry

Health/Safety Administration and the Computer

Trends and Legal Aspects of Benefits Strategy

Your Industry: Problems, Requirements, and Systems Solutions

Thursday, October 26

9:00-12:15 p.m.

Concurrent Workshop Sessions

(Each given in 9:00-10:30 a.m. and 10:45-12:15 p.m. sessions)

Successfully Managing the Human Resource System

International HRS - Design and Applications

Basics of Computerized Personnel Information

Testing and Selection Criteria: An EEO Perspective

Installation of a Multi-site HRIC

Reducing State Unemployment Insurance Costs Through HRS/Payroll
Processing

EEO Systems for Colleges and Universities

12:15-2:00 p.m.

Luncheon

Affirmative Action: The Human Dimension

Harold E. Krents, Esq., Surrey, Karasik and Morse

2:00-3:30 p.m.

Concurrent Workshop Sessions

Human Resources COM Applications

HRS/Payroll Entry via Remote Computer

Position Control

Strategy of Group Insurance Funding

The Handicapped: Personnel Policies and Practices

Effective Systems Analysis and Problem Avoidance in System
Development

ERISA Retirement Quote System



Jack
Hight



Senator
Harrison A.
Williams, Jr.



Weldon
Rougeau



Harry
McPherson



Edgar D.
Mitchell



Harold E.
Krents

Registration and Early Bird Welcome Party
Monday evening, October 23. Record at-
tendance is expected. For reservations
and/or additional information write InSci at
95 Chestnut Ridge Road, Montvale, New
Jersey 07645. Or call Ms. Sheila Alper at
201-391-1600.